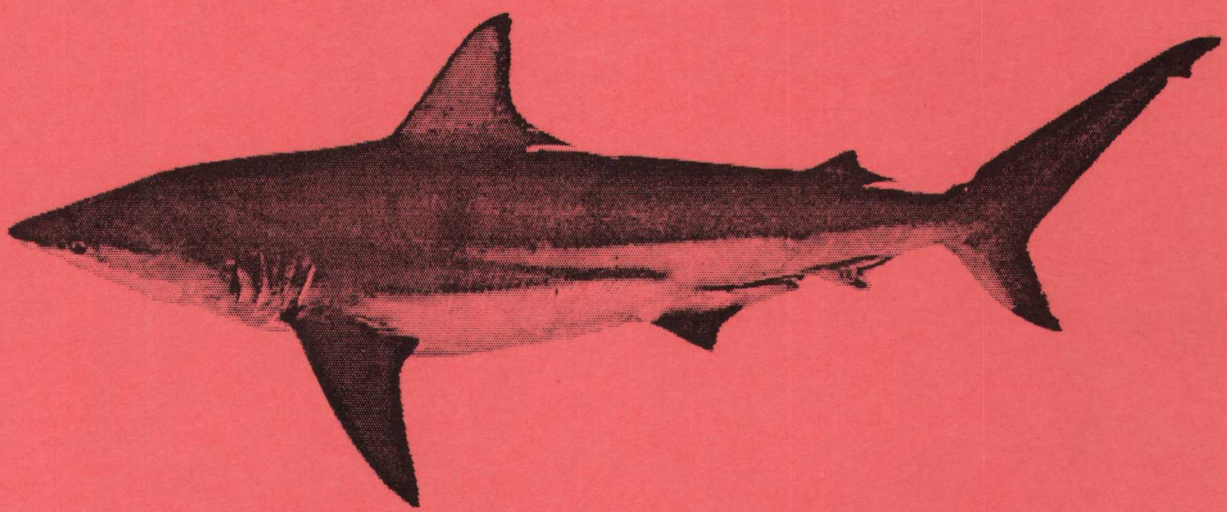
NOAA Technical Memorandum
NMFS-SEFSC-338

A FIELD GUIDE TO THE SHARKS COMMONLY CAUGHT IN COMMERCIAL FISHERIES OF THE SOUTHEASTERN UNITED STATES



December 1993

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Science Center
75 Virginia Beach Drive
Miami, Florida 33149

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by
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A FIELD GUIDE TO THE SHARKS COMMONLY CAUGHT IN COMMERCIAL FISHERIES OF THE SOUTHEASTERN UNITED STATES

The commercial shark fishing industry of the southeastern United States has grown very rapidly and landings have increased geometrically during the last six years. Historically, intensive shark fisheries everywhere have been very short lived. Overfishing of shark stocks has invariably led to the collapse of the fisheries in a few years. This is due to the very slow growth and the very low reproductive potential of most sharks. Most species of commercially important large sharks take decades to reach sexual maturity, and then they only produce a small litter of pups every other year. This low reproduction or replacement rate makes it imperative that shark fisheries be managed conservatively and that they be exploited rationally. Only rational exploitation can insure the survival of the stocks and the continuity of the fishery.

Although the NMFS has been collecting statistics on commercial landings of sharks for 30 to 40 years, the data presently available are insufficient for stock assessment and fishery management. At present, data on shark landings are lumped under the generic categories of "shark," or broken down into "mako," "thresher," "hammerheads," and "others". There are several reasons for the generic approach to shark statistics. First, there are about 40 species of sharks caught in the fisheries along the east coast of the United States. Second, there has been little incentive for fishermen and port samplers to recognize different species of sharks. Fishermen usually receive the same price for all species of sharks, with the exception of the shortfin mako that usually commands a premium price. Third, most fishermen butcher sharks at sea immediately after capture to preserve the quality of the meat and to reduce the required storage space. Usually the head, guts, and most of the fins, are removed. The gutted, headless, and almost finless carcass, usually called a "log," is then iced or refrigerated until arrival at port or the fish house. Shark carcasses, or "logs," larger than 100 pounds are often cut into two or more sections for ease of handling. Fins are stored in the freezer or placed to dry in the rigging. Carcasses and boxes of fins are offloaded at the docks days after capture. In most cases, only the dressed carcasses are available to dealers or to port samplers. Thus, it is difficult for dockside observers to determine the species of shark being landed. Consequently, the NMFS has been collecting and reporting data on all species of sharks under one or more generic categories.

The generic categories for reporting shark statistics force fishery managers into treating and managing multiple shark species as one generic stock. A generic approach may allow a species to be severely impacted, or even disappear, before the fishery managers are aware of its condition. Conversely, stocks of another species may be in good condition, and yet they may be denied to fisheries because the shark quota has been reached. Successful and efficient management of the shark fishery will require management by species or, at least, by ecological categories or species complexes. Regardless of the approach taken by the fishery managers, statistical collections on the fishery will require species identification and size frequency data by species. Therefore, it becomes imperative that the personnel collecting fishery statistics on sharks be capable of recognizing species of sharks.

The purpose of this guide is to enable fishery personnel to identify sharks and shark carcasses by their diagnostic characteristics. It is intended for identification of only those species commonly found in commercial or recreational landings. No attempt has

been made to include all the species found in the area. It is expected that the guide will eventually be used by seafood dealers and fishermen, thus the use of dichotomous keys has been avoided, because fishermen and seafood dealers have expressed a dislike for those keys. It is assumed that, for the identification of intact specimens, users will simply thumb through the pages until a identification is obtained. Species of sharks are grouped by the fisheries in which they are usually caught, and similar looking sharks are grouped in adjacent pages to facilitate comparisons. The information contained here has been abridged from my book, ***The Sharks of North American Waters*** (© 1983, Texas A&M University Press, College Station, Texas. 180 pp.), and adapted to make it more useful to fishery observers and fishermen.

The first step in identifying a carcass is to determine where the catch comes from or the type of fishery where the shark was caught. These fisheries are: 1) coastal shark fisheries, that operate near shore in shallow water or in coastal waters less than 182 m (100 fathoms), usually fishing on the bottom using nets or longlines; 2) deep water bottom fisheries that usually operate bottom longlines at depths greater than 182 m (100 fathoms), such as tilefish and wreckfish operations; 3) pelagic fisheries, that operate longlines near the surface or in midwater over deep water, far offshore, such as tuna and swordfish fisheries. Once the fishery has been determined, the user can then turn to the section encompassing the species in that fishery and check the species descriptions until a match is obtained. The use of these fishery categories is simply to make identification of carcasses possible. This approach is not foolproof; it serves simply to narrow the choices.

The approach to carcass identification is based on the premise that most species of sharks are caught in only one type of fishery while some are caught in two or more fisheries. For example, finetooth, blacknose, and lemon sharks are caught in coastal fisheries, usually those operating in very shallow water, not in pelagic or deep water operations. Sandbar, dusky, blacktip are usually caught in coastal longline fisheries over a wide depth range. Shortfin mako, blue, oceanic whitetip, and bigeye thresher sharks are normally found in blue water pelagic fisheries such as tuna and swordfish longlines. Sixgill sharks and roughskin spiny dogfish are caught in deep water bottom fisheries such as tilefish and wreckfish operations, they are not caught in coastal or pelagic fisheries. Some species of sharks encompass different habitats in their wide ranges. For example, the scalloped hammerhead and the silky shark are coastal-oceanic species. Thus, they may be found in both coastal and pelagic fisheries. Finally, one must also realize the possibility that a surface dwelling species may take the bait on its way down to the bottom in a wreckfish or tilefish operation. Therefore, if the user can not find the shark being identified in one fishery category, then the other categories should be checked as well.

The identification of shark species by carcass alone has not been attempted before. Based on the author's experience, species identification is usually possible even when only the cleaned carcass, or "log," is available. In most shark fishing operations along the southeastern United States, the head, pectoral fins, first dorsal fin, and the tail of the shark are removed along with the guts, leaving only the second dorsal and anal fins on the carcass. Knowledge of the diagnostic characteristics of each species and of the origin of the carcass will usually allow carcass identification. Thus, a description of the carcass is provided in each species account to aid in dockside identification. Positive identification of the carcasses of some of the ridge-backed sharks may be difficult at this time. In those cases, a complete specimen or at least a jaw must be seen for identification.

Presently, there are various researchers developing laboratory procedures of identifying shark carcasses. Most of those procedures are based on immunological reactions that are species specific. However, the implementation of such methods with species identification kits for field personnel is still far into the future. Thus, this guide is intended to be used until such time when more precise methods of species identification become available. Identification by diagnostic characteristics will remain the cheaper and most readily available method.

The identification of sharks is difficult for the uninitiated. The identification of finned or partly finned shark carcasses by their diagnostic characteristics is obviously much more difficult. The user may have to employ an investigative approach at carcass identification. It should also be remembered that this guide is the first attempt to carcass identification. The author welcomes comments on how to improve it.

SHARKS CAUGHT IN DEEP WATER BOTTOM FISHERIES (TILEFISH AND WRECKFISH LONGLINES)

Sixgill shark
Bigeye sixgill shark
Sevengill shark
Roughskin spiny dogfish
Greenland shark
Chain dogfish
Bignose shark
Night shark

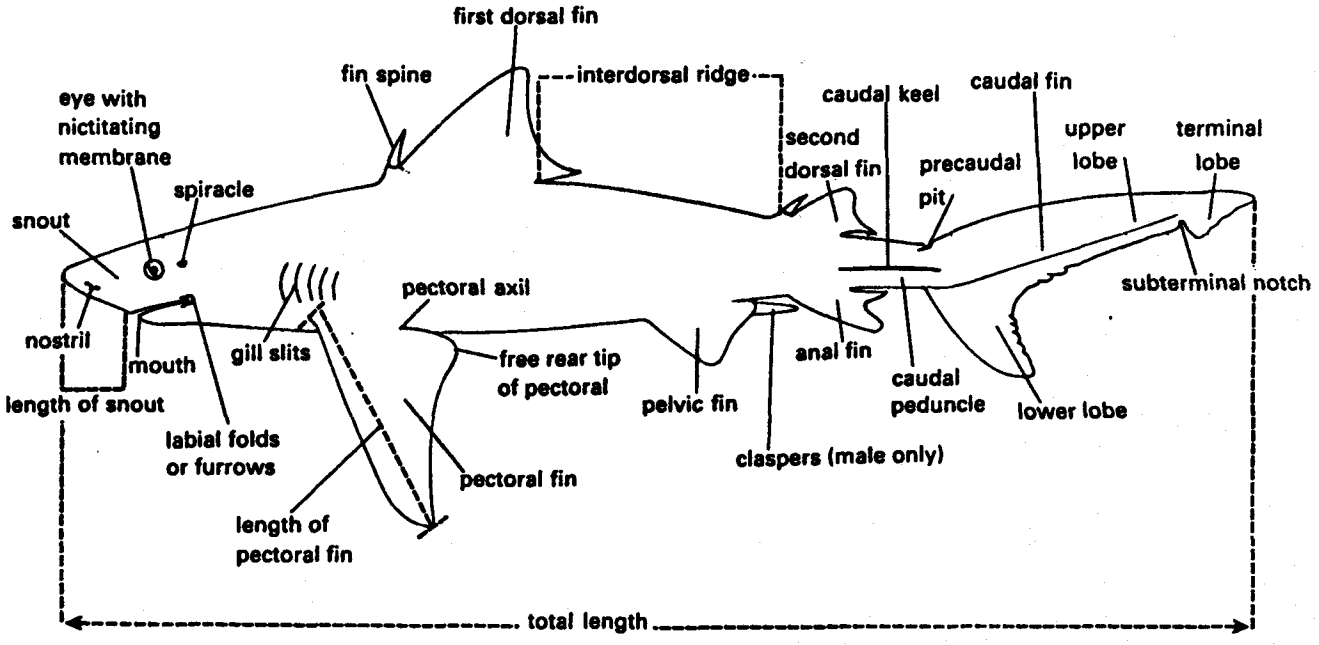
SHARKS CAUGHT IN PELAGIC FISHERIES (SWORDFISH AND TUNA LONGLINES)

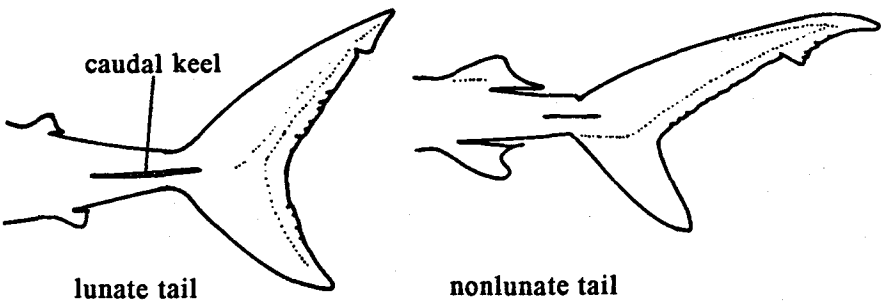
Shortfin mako
Longfin mako
Porbeagle
Bigeye thresher
Common thresher
Blue shark
Oceanic whitetip shark
Silky shark
Bignose shark
Night shark
Scalloped hammerhead

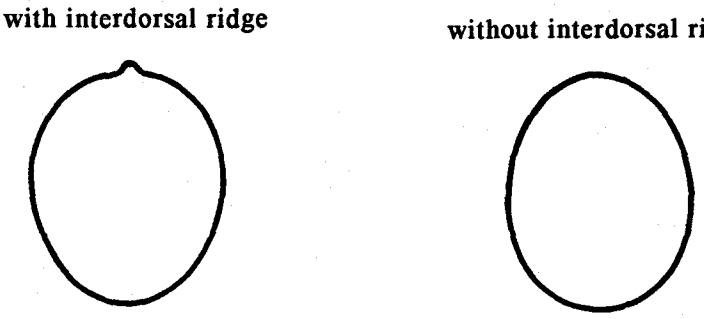
SHARKS CAUGHT IN COASTAL FISHERIES

White shark
Bignose shark
Blacknose shark
Blacktip shark
Bull shark
Dusky shark
Finetooth shark
Galapagos shark
Lemon shark
Night shark
Sandbar shark
Silky shark
Spinner shark
Tiger shark
Atlantic sharpnose
Bonnethead
Scalloped hammerhead
Great hammerhead
Smooth hammerhead
Sand tiger shark
Angel shark
Nurse shark
Basking shark
Spiny dogfish

SHARK ANATOMY





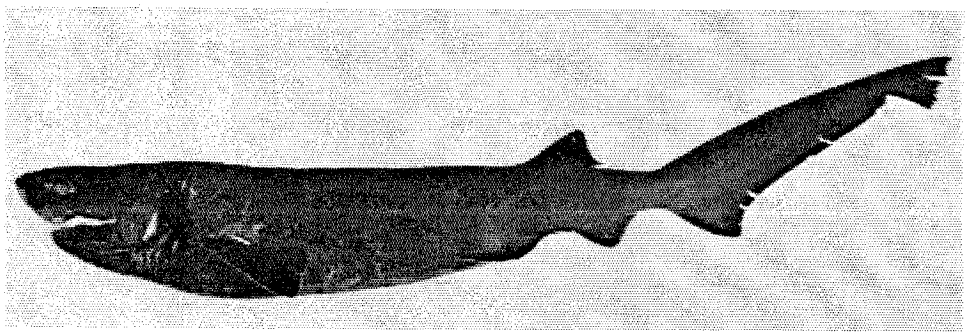


Shark external anatomy (From the book, **The Sharks of North American Waters** © 1983 by J.I. Castro).

SHARKS CAUGHT IN DEEP WATER BOTTOM FISHERIES:

(Also see bignose shark (p. 32) and night shark (p. 21))

SIXGILL SHARK (*Hexanchus griseus*)



Recognition: The sixgill shark has a single dorsal fin, six gill slits, and six large broad, sawlike teeth on each side of the lower jaw.

Color: Color is brown above with lighter undersides, occasionally uniformly dark brown.

Size: The sixgill shark is one of the largest deepwater sharks. The largest on record is a female 482 cm (15.8 ft) long. It probably gets much larger.

Similar species: The bigeye sixgill shark has six teeth on each side of the lower jaw. The sevengill shark has seven instead of six gill slits.

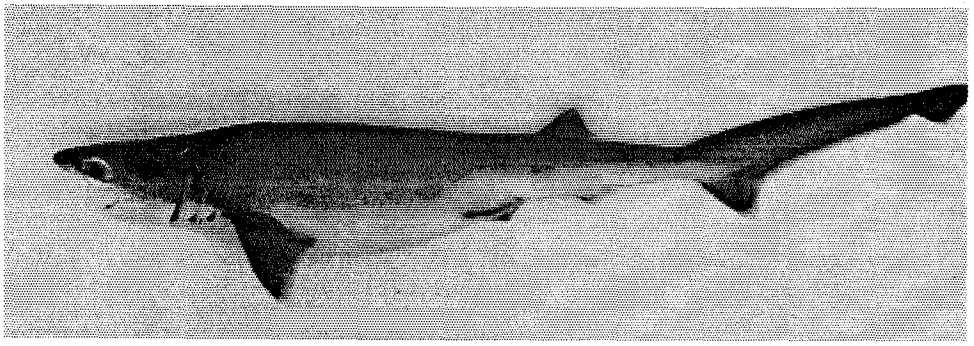
Biology: This is a very large, bottom dwelling, deep water shark. It is usually found at depths greater than 182 m (100 fathoms), although it has been reported in shallow water (10-20 m) off Washington state and off British Columbia. It has worldwide distribution in temperate and tropical waters. In our area, it has been reported from North Carolina to Florida and the Gulf of Mexico.

Economic importance: It is often marketed off the west coast, where it is known as cowshark. It is seldom marketed along the east coast, because few fishermen bring them in.

Fishing: It is usually caught while fishing on the bottom at depths greater than 100 fathoms. Juveniles are often caught while fishing for tilefish. The adults are seldom caught because of their very large size and because they seem to be in waters deeper than 730 m (400 fathoms) where there are few fishing operations.

Carcass: Any carcass larger than 150 cm (5 ft) with a single dorsal fin and soft uncalcified vertebrae is probably a sixgill shark. Carcasses of smaller specimens can be confused with the bigeye sixgill shark.

BIGEYE SIXGILL (*Hexanchus vitulus*)



Recognition: The bigeye sixgill shark has a single dorsal fin, six gill slits and five large, sawlike teeth on each side of the lower jaw.

Color: Color is light brown above with lighter undersides, fading to pale brownish gray after death.

Size: Average size is about 165 cm (55 in). Maximum size is 180 cm (71 in).

Similar species: The sixgill shark has five large, broad teeth on each side of the lower jaw. The sevengill shark has seven gill slits.

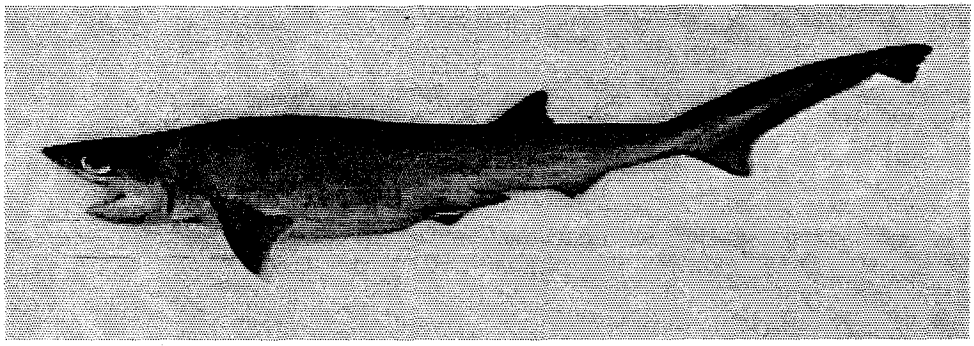
Biology: This species is found worldwide in deep water. In our area it has been found around Florida, the Gulf of Mexico, and the Bahamas. Very little is known about its habits.

Economic importance: None. It is very seldom seen in our fisheries.

Fishing: Most specimens have been captured at depths of (220 fathoms) in grouper or tilefish operations.

Carcass: Separation of carcasses of very small juvenile sixgill and bigeye sixgill sharks is not possible at this time. Carcasses larger than 150 cm (5 ft) will be sixgill sharks.

SEVENGILL SHARK (*Heptranchias perlo*)



Recognition: This shark has seven gill slits and a single dorsal fin.

Color: Color is brownish gray above with paler undersides.

Size: Average size is about 100 cm (39 in), but adults may reach 137 cm (54 in).

Similar species: The sixgill and the bigeye sixgill sharks have six instead of seven gill slits.

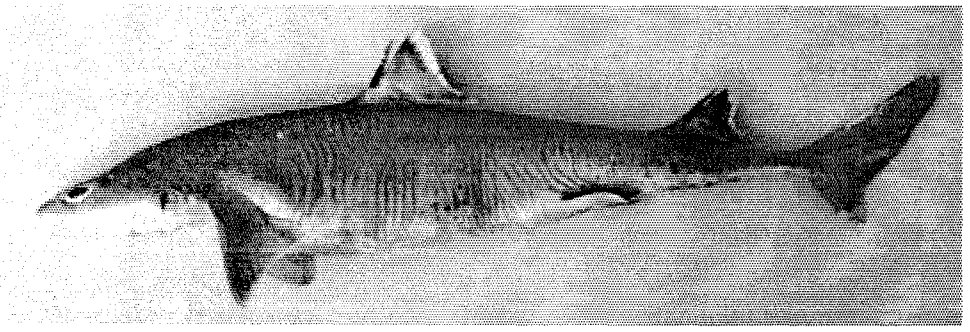
Biology: This is a deep water species of the continental shelves. It has worldwide distribution. Most of our specimens have been caught off South Carolina. Very little is known of its habits or diet.

Economic importance: None. The flesh has been said to be mildly poisonous but this needs to be confirmed (Any volunteers?).

Fishing: Most specimens are caught in tilefish operations at depths of (100-200 fathoms).

Carcass: Sevengill sharks are not utilized in east coast fisheries at this time.

ROUGHSKIN SPINY DOGFISH (*Squalus asper*)



Recognition: The roughskin spiny dogfish has two dorsal fins each with a stout spine, the second dorsal is almost as large as the first, and both dorsal fins have a wide white band at their trailing edges. Its skin denticles are large enough to be seen with the naked eye, hence its name.

Color: Color is brownish gray above with paler or whitish undersides.

Size: Most specimens measure about 90 cm (35 in). It grows to at least 118 cm (46 in).

Similar species: There are other dogfishes in the area, but they lack the wide white band at the trailing edge of the dorsal fins.

Biology: This is a common deep water dogfish, but little is known about it because the species was not described until 1973. It appears to be widely distributed in deep water.

Economic importance: None. It has no commercial utilization at this time.

Fishing: Most specimens have been isolated catches at depths of 22-550 m (120-300 fathoms).

Carcass: Carcasses are not found in the fishery at this time.

GREENLAND SHARK (*Somniosus microcephalus*)

Recognition: The Greenland shark is a stout shark, usually very large, with two spineless dorsal fins of nearly equal size, the first one originating about midway on the trunk, and no anal fin.

Color: Color is brown, black, purplish gray, or slaty gray above and below. The sides may have violet tinge, or they may have scattered dark bands or white spots. Two white specimens have been reported (albinos?).

Size: Average size is about 340 cm (11.1 ft). The largest on record measured 640 cm (21 ft) and weighed 1,022 kg (2,250 lb).

Similar species: There are other squaloid sharks in the area that are not covered in this guide (See Castro, 1983 for other species). The prickly shark and the bramble shark have the first dorsal fin over or posterior to the origin of the pelvic fins.

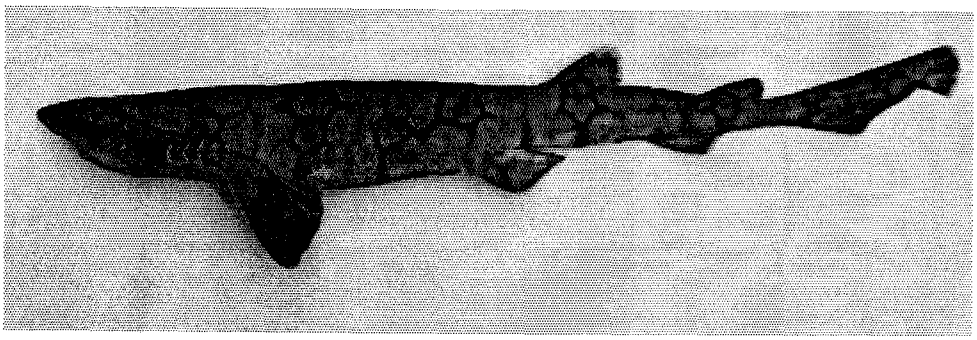
Biology: This is the only shark regularly found in the arctic waters of the Atlantic Ocean. It has been reported from Baffin Bay to the Gulf of Saint Lawrence. It occasionally strays south to Cape Hatteras in deep waters.

Economic importance: The flesh is poisonous when fresh and it must be dried or boiled several times before consumption. Therefore, it is not found in U.S. markets.

Fishing: Most specimens in our area have been caught in deep water trawls or on longlines set in deep waters.

Carcass: Greenland sharks are not usually found in our landings. Any carcass over 300 cm (10 ft) lacking an anal fin is likely to be a Greenland shark.

CHAIN DOGFISH (*Scyliorhinus retifer*)



Recognition: This tiny, slender catshark has a first dorsal fin originating posterior to the pelvic fins, and distinctive black or brown lines forming a chainlike pattern over the back and sides.

Color: Color is reddish brown above and yellowish below.

Size: Adults measure about 50 cm (20 in).

Similar species: There are other catsharks in the area that resemble the chain dogfish. They sometimes get caught in longlines. Their markings are solid saddle blotches instead of chainlike, or they have white spots among chainlike markings. Many of those catsharks are rare and there may be some new or undescribed species among them. Whenever possible, catsharks, other than the chain dogfish, that are caught in longlines should be preserved and turned over to biologists.

Biology: The chain dogfish ranges from Georges Bank to Nicaragua, including the Gulf of Mexico. It appears to be most common from Virginia to South Carolina. It is a bottom dwelling species found in the deep waters of the continental slopes, usually at depths of 182-460 m (100-250 fathoms), although it is found in water as shallow as 37 m (20 fathoms) in the northern (colder) parts of the range.

Economic importance: None. It may be a nuisance in tilefish operations.

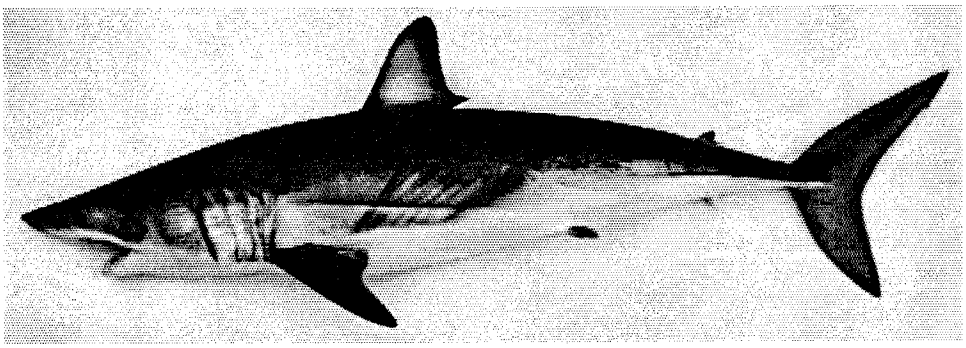
Fishing: The juveniles are taken by trawling over sandy bottoms, the adults are caught in longlines over rocky areas.

Carcass: The chain dogfish is too small to be utilized commercially. The chainlike markings would be sufficient to identify it.

SHARKS CAUGHT IN PELAGIC FISHERIES (SWORDFISH AND TUNA LONGLINES)

(Also see white shark (p.23), bignose shark (p.32), night shark (p.21), and scalloped hammerhead (p. 39))

SHORTFIN MAKO (*Isurus oxyrinchus*)



Recognition: The shortfin mako has a conical snout, short pectoral fins (usually less than 70% of the head length), long and slender smooth-edged teeth, and a lunate tail.

Color: Living and freshly caught shortfin makos are deep metallic blue above and white below. After death the color fades to a very dark blue or bluish black. The underside of the snout and the area around the mouth are white.

Size: Most specimens seen in the U.S. range from 180-250 cm (71-98 in) The largest females may reach 380 cm (12.5 ft) and weigh 570 kg (1,250 lbs).

Similar species: The longfin mako has much longer pectoral fins and the underside of its snout and the area around the mouth are dusky or blue-black. The porbeagle has teeth with lateral cusps. The white shark has triangular teeth with serrated edges.

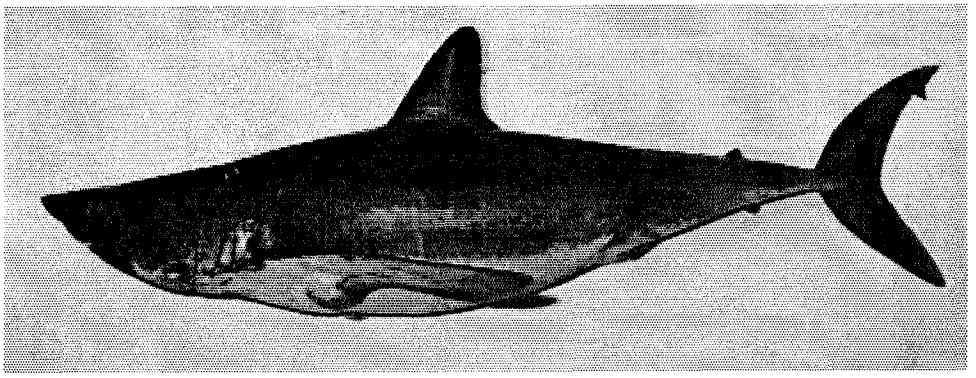
Biology: The shortfin mako is found in warm and warm temperate waters throughout the world. It is very common from Cape Cod to Cape Hatteras. It is an oceanic shark at the very top of the food chain. It feeds on fast moving fishes such as swordfish, bluefish, tunas and other sharks.

Economic importance: The shortfin mako is one of the world's great gamefishes. Once hooked it puts up a spectacular fight, often leaping high into the air. It is also one of the most desired sharks for food, its flesh being of excellent quality. It usually commands a higher price than other sharks.

Fishing: The shortfin mako is caught with trolled baits and lures as well as with live or dead bait. It is often caught on swordfish and tuna longlines.

Carcass: Shortfin mako carcasses are easily recognized by the presence of a keel on the caudal peduncle (the area in front of the tail), by their dark blue color above and white below, and by the presence of a wide band of dark tissue on both sides of the body (in steak cut).

LONGFIN MAKO (*Isurus paucus*)



Recognition: The longfin mako has a conical snout, very large eye and very long pectoral fins, a lunate tail with a subterminal notch, and long, slender smooth-edged teeth.

Color: Color is dark blue to bluish black above, and bluish gray or dusky below. The underside of the snout and the area around the mouth are dusky or bluish black.

Size: The largest recorded measured 417 cm (13.7 ft).

Similar species: The shortfin mako has much shorter pectoral fins and the underside of its snout and the area around the mouth are white.

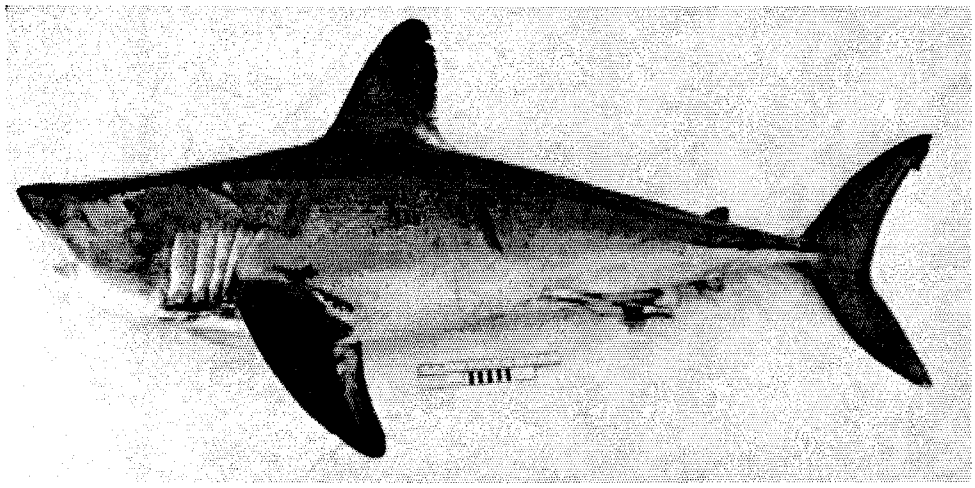
Biology: This is a deep dwelling oceanic shark found in warm waters throughout the world. In our area, it has been reported from the Grand Banks to the Gulf of Mexico. Most catches occur off Florida. It is a very poorly known species that was not described until 1966.

Economic importance: The meat is said to be of poor quality. It is very rare in our fisheries to be of any economic importance.

Fishing: It is usually caught on longlines in deep tropical waters, usually while fishing deep for swordfish.

Carcass: Longfin makos are not landed because of the poor quality of the flesh. Carcasses are similar to the shortfin mako, except that the flesh is much darker and less firm.

PORBEAGLE SHARK (*Lamna nasus*)



Recognition: The porbeagle shark has a conical snout, a first dorsal fin originating over or anterior to the pectoral fin axil, and a lunate tail with a secondary keel. The teeth are smooth edged and have lateral cusps.

Color: Color is dark bluish gray to brown above changing abruptly to white below. There is usually a patch of white at the trailing edge of the first dorsal fin.

Size: Most specimens caught measure 150-180 cm (59-71 in). It is said to reach 365 cm (12 ft).

Similar species: The white shark has triangular teeth with serrated edges. The makos lack the secondary keels on the tail and the lateral cusps on the teeth.

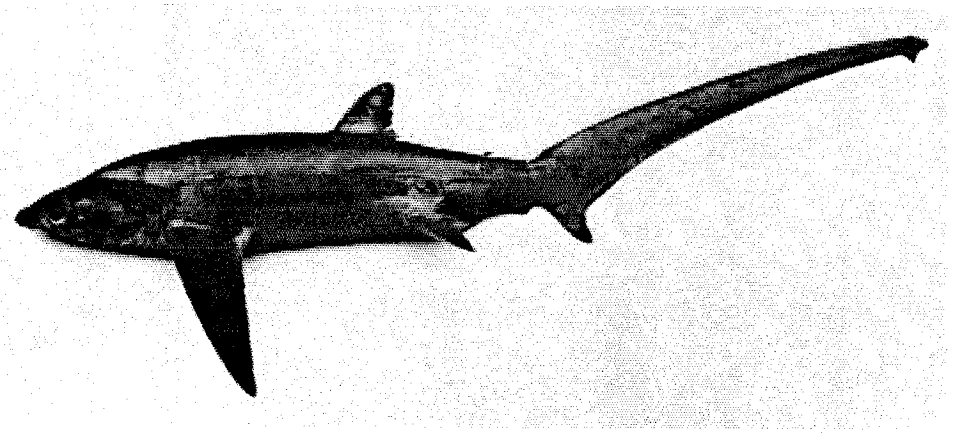
Biology: The porbeagle shark inhabits cold-temperate waters of the Atlantic and Pacific oceans. In North America it ranges from Newfoundland to New Jersey, being locally common from southwest of the Grand Banks to Massachusetts Bay. It is found in both inshore and offshore waters colder than 19°C (66°F) over the continental shelves. It feeds on cod, mackerel, hake, flounder, many other fishers, and squid.

Economic importance: In the past, the porbeagle was in great demand for its liver oil. In the 1960's, if was actively fished for by Norwegian fishermen, who took about nine million pounds yearly, destined for European meat markets. The fishery collapsed in a few years due to overfishing. It was not until the late 1980's that porbeagles appeared again off New England in commercial numbers.

Fishing: It is often hooked on lines put out for cod. It is classed as a gamefish because it puts up a determined fight.

Carcass: A stout carcass with two caudal keels (the second or lower one being very small), black to dark gray in color, much darker than makos, found in New England only.

BIGEYE THRESHER (*Alopias superciliosus*)



Recognition: A thresher shark with an enormous tail measuring about 55% of the total length, and an enormous, upward-looking eye, and a marked groove on both sides of the head, running from above the eye to the gill slits, and a first dorsal fin located over or slightly ahead of the origin of the pelvic fins.

Color: Color is dark purplish brown above with metallic hues along the sides, with somewhat lighter to pale cream undersides. The metallic hues disappear after death.

Size: Most specimens captured measure from 335-400 cm (11-13 ft) TL and weigh over 160 kg (350 lb).

Similar species: The common thresher lacks the groove above the head and the enormous eye.

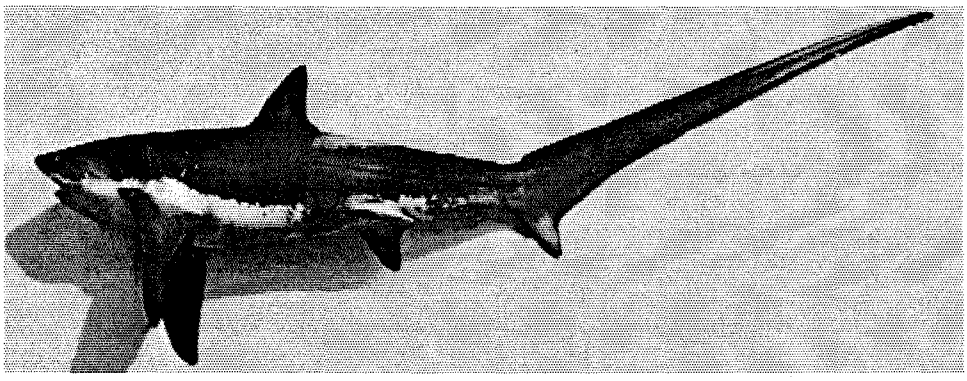
Biology: The bigeye thresher is cosmopolitan in warm and temperate waters. It is a deep-water species whose habits are poorly known. It ascends in the water column at night and many are caught at depths of 20-85 fathoms. It feeds on schooling fishes which it stuns with blows from its powerful tail.

Economic importance: The species is of little commercial interest because the poor quality of its stringy flesh and low quality fins.

Fishing: The bigeye thresher is often caught on longlines set for swordfish. It has almost no commercial value.

Carcass: Bigeye threshers are not landed commercially. Nevertheless, a bigeye thresher carcass would have the rear portion of the dorsal fin cut (or the rear tip of the fin if it is still in place) at about the level of the origin of the pelvic fins, and a very strong caudal peduncle nearly rectangular in crossection. Most bigeye threshers seen off the east coast are large, usually over 300 cm TL (10 ft.). In case of doubt, the skin denticles can be used to separate the bigeye thresher from the common thresher. The bigeye has two types of skin denticles: most denticles are minute, expanded anteriorly and tapering to a point, similar to spear point or arrowhead; interspersed among these denticles there are much larger denticles set in pairs, one behind the other. Those of the common thresher have ridges and three rearward points.

COMMON THRESHER (*Alopias vulpinus*)



Recognition: The common thresher has an enormous tail that measures about 50% of the total length, and the first dorsa fin free rear tip located well ahead of the pelvic fins.

Color: Color varies from black to brown above, with metallic hues. The undersides are white.

Size: Specimens 300-500 cm (10-16 ft) TL are common. It may reach 610 cm (20 ft).

Similar species: The bigeye thresher has an enormous eye and a groove along the top of the head.

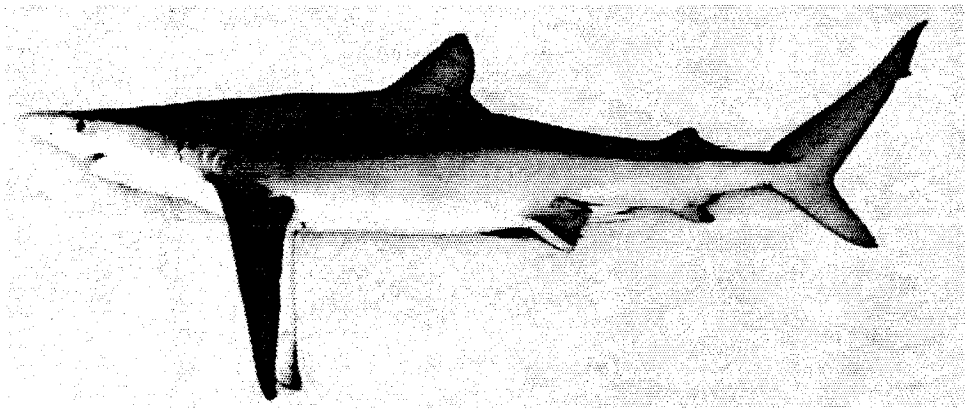
Biology: The common thresher is cosmopolitan in warm and temperate waters. In our area it ranges from Newfoundland to the Gulf of Mexico. This is a pelagic species that often wanders close to shore while pursuing schools of fish or in cool weather. It feeds on schooling fishes which it stuns with blows from its powerful tail.

Economic importance: It is an important commercial species off California, but it is not common in markets along the east coast.

Fishing: Most longline catches occur at depths of about 182 m (100 fathoms).

Carcass: The very large, stout, nearly rectangular in cross section caudal peduncle should be sufficient to identify it as a thresher shark. If the carcass is known to be from a thresher shark, it is probably the common thresher because bigeye threshers are not utilized in our fisheries. These two species can be separated based on the skin denticles (See section on the bigeye thresher for difference in skin denticles).

BLUE SHARK (*Prionace glauca*)



Recognition: The blue shark has a snout longer than the width of the mouth, very long pectoral fins about as long as from the tip of the snout to the last gill slit, the midpoint of the first dorsal fin base closer to the pelvic fin origin than to the pectoral axil, and weak keels on the caudal peduncle.

Color: Color is dark indigo blue on top, shading to bright blue with metallic hues on the sides. The undersides are white. The blue color changes to dark gray soon after death.

Size: Usual size is 180-240 cm (71-94 in). The largest on record measured 383 cm (12.6 ft). It is said to grow much larger.

Similar species: The shortfin mako has a similar blue color but differs in having a conical snout, and long smooth-edged teeth.

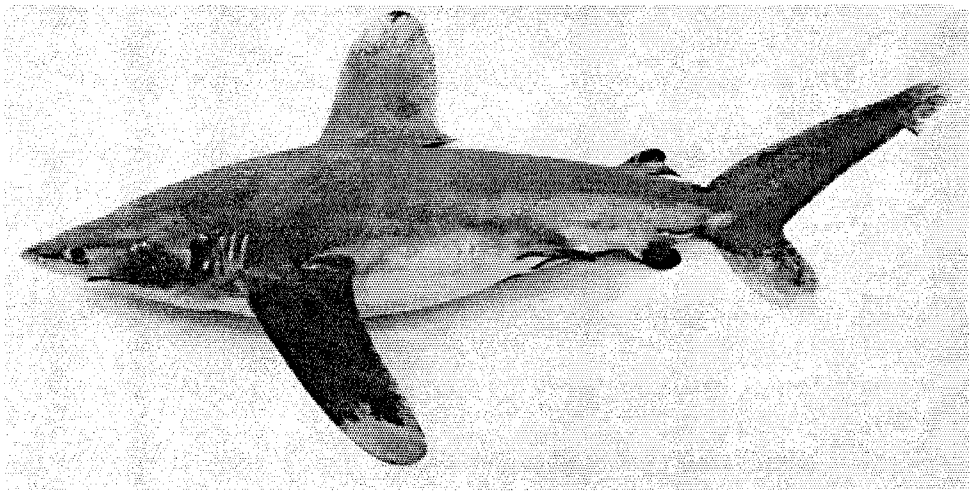
Biology: This is probably the most common large shark in the open oceans. It is cosmopolitan in tropical, subtropical, and temperate waters. Off North America, it ranges from Newfoundland to Florida and the Gulf of Mexico. It inhabits clear, deep blue waters where the depth is greater than 182 m (100 fathoms, seldom venturing near land, except in clear deep water around islands.

Economic importance: In spite of its abundance, the blue shark is of little economic importance because both its flesh and fins are of poor quality.

Fishing: It is often taken in tuna longline operations.

Carcass: Blue shark carcasses are very seldom landed because they have very little, if any, commercial value. The carcass is relatively long and thin, blackish blue in color, and has very week keels on the caudal peduncle.

OCEANIC WHITETIP SHARK (*Carcharhinus longimanus*)



Recognition: The oceanic whitetip shark has a snout shorter than, or as long as, the width of the mouth, a weak interdorsal ridge, a first dorsal fin with broad and evenly rounded apex, very long pectoral fins, (as long, or longer than, the distance form the tip of the snout to the last gill slit).

Color: Color varies from brown to olive gray above and from dirty white to yellow below. Most specimens in our area have a characteristic shade of brown. The dorsal fins, the pectoral fins, and the caudal lobes are whitetipped, hence the name. Newborns and small juveniles under 36 in. have (or may have) blacktipped fins and dark brown saddle marks over the caudal peduncle. The dark pigment fades within a few months after birth.

Size: Most specimens caught measure 150-250 cm (59-98 in) and 35-70 kg (80-150 lb). It is said to reach 350 cm (11.5 ft) and perhaps longer.

Similar species: The bull shark has a short snout also, but it lacks the interdorsal ridge and the evenly rounded fins. The bull shark is a coastal species not found in pelagic waters.

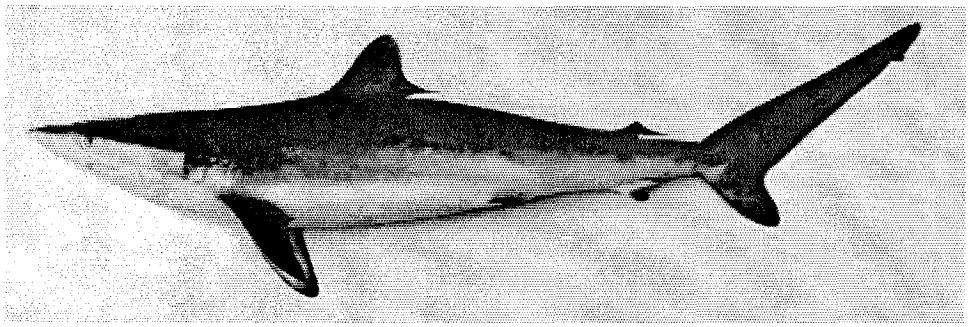
Biology: This is a pelagic species found in all tropical oceans where the temperature exceeds 22° C (72° F) and the depth exceeds 182 m (100 fathoms).

Economic importance: It is sometimes caught on tuna and swordfish longlines. It is often marketed.

Fishing: It is usually caught on pelagic longlines.

Carcass: The characteristic brown color and presence of a weak interdorsal ridge are usually enough to distinguish it in catches of pelagic sharks. Very small carcasses will have dark saddle blotches near the tail. The large, paddle-like fins with rounded white-tipped fins are unmistakable. Their presence in the catch would confirm the carcass identification.

SILKY SHARK (*Carcharhinus falciformis*)



Recognition: The silky shark has a snout shorter than the width of the mouth, a low sloping first dorsal fin originating behind the free rear tip of the pectoral fins, an interdorsal ridge, and a second dorsal fin with a very long posterior free rear tip (about 2 1/2 times the vertical height of the fin). The upper teeth are broadly triangular, with serrated edges and weakly notched outer margins, and become increasingly oblique towards the corners of the mouth; their serrations are larger at the bases of the teeth than at the tips. The lower teeth have narrow cusps and broad bases, and are symmetrical, erect, and smooth-edged.

Color: Color is bronze brown above, fading to gray after death, and white below.

Size: It reaches about 330 cm (10.8 ft).

Similar species: In the dusky shark the free rear tip of the second dorsal is never more than twice the height of the fin. Both the dusky and the Galapagos sharks have uniformly serrated teeth. The night shark has a much longer snout.

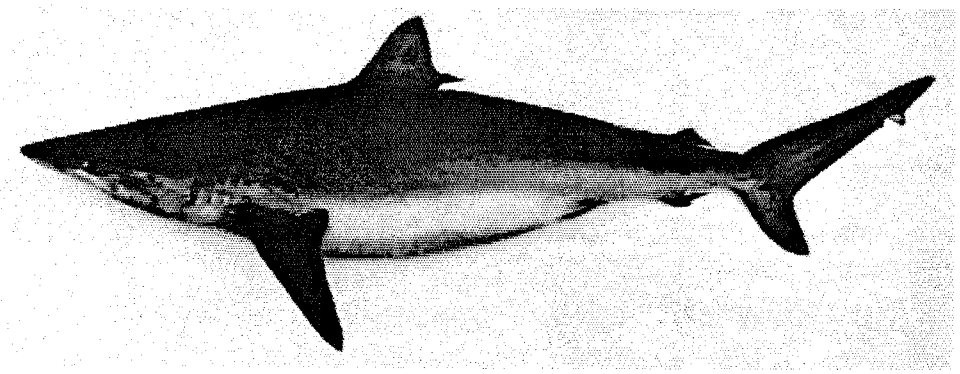
Biology: The silky shark is cosmopolitan in warm tropical and subtropical waters. It is primarily an oceanic shark, but juveniles and subadults often come close to shore, usually in the summer.

Economic importance: The silky shark is found in all our fisheries both coastal and pelagic longlines.

Fishing: It is usually caught on surface longlines.

Carcass: The presence of an interdorsal ridge and the extremely long free rear tip of the second dorsal fin serve to identify silky shark carcasses. The skin of the silky shark feels smoother to the touch than that of other sharks (hence the reason for the name silky). With a little practice one can learn to do a preliminary identification of silky sharks based on touch.

NIGHT SHARK (*Carcharhinus signatus*)



Recognition: The night shark has a snout longer than the width of the mouth, large greenish eyes, a relatively small first dorsal fin originating behind the free rear tips of the pectoral fins, and a low interdorsal ridge. The teeth are smooth-edged or finely serrated. The upper teeth have increasingly oblique cusps with a pronounced notch on their outer margins, and two to five serrations from notch to base.

Color: Color is grayish blue above and grayish white below.

Size: It grows to about 280 cm (9.2 ft).

Similar species: The combination of interdorsal ridge, large greenish eyes, and the characteristic teeth distinguish the night shark from other requiem sharks in the area.

Biology: The night shark appears to be widely distributed in warm waters throughout the Atlantic.

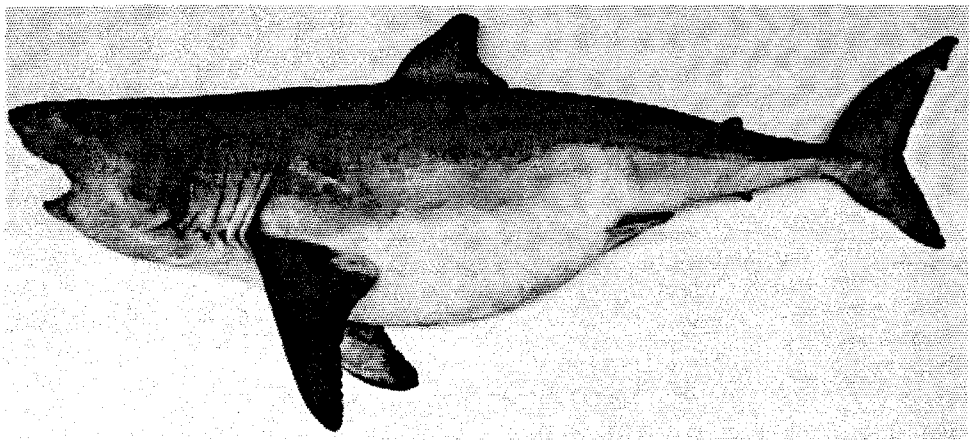
Economic importance: In the past decade large numbers of night sharks were caught on swordfish longlines. Usually these fish were released or discarded. Nowadays many are finned because of the high price of fins.

Fishing: It is usually caught on longlines at depths greater than 182 m (100 fathoms).

Carcass: Although night sharks are very easy to identify, the partially finned carcass may be difficult to identify. Consider the origin of the carcass to eliminate some species. Most night sharks are caught by swordfish boats while fishing deep for swordfish. The night shark carcass has a low interdorsal ridge, loosely spaced dermal denticles whose rear margins usually have three teeth, a very dusky anal fin. Most of the other ridge-backed carcharhinids have overlapping skin denticles, except for the sandbar and bignose that have non-overlapping denticles.

SHARKS CAUGHT IN COASTAL FISHERIES

WHITE SHARK (*Carcharodon charcharias*)



Recognition: The white shark has a conical snout, large triangular teeth with serrated edges, and a lunate tail with caudal keels.

Color: Color varies from leaden white to slaty brown or black above, and dirty white below. There is usually a dark spot around the axil of the pectoral fin.

Size: The largest specimens measure from 580 to 640 cm and weigh in excess of 2,000 kg (4,800 lb). It is likely that larger white sharks exist, but there are no documented cases to prove their existence.

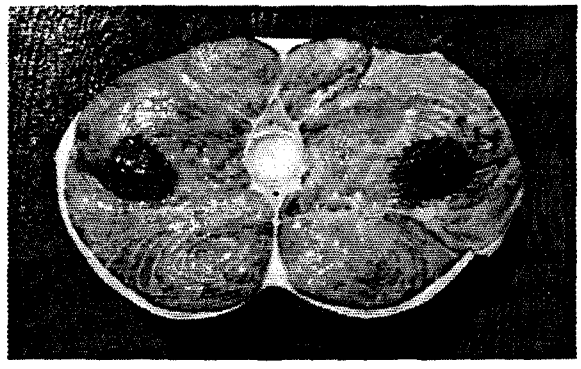
Similar species: The makos and the porbeagle have similar snouts and tails but their teeth are smooth-edged.

Biology: The white shark is found throughout temperate, subtropical and tropical seas. It has been recorded from Newfoundland to Florida and the Gulf of Mexico. It inhabits the cool waters of the continental shelves and strays into warmer waters in winter. It is a strong-swimming, voracious predator that feeds on seals, sea lions, porpoises, tunas, sturgeon, and other sharks. It has been known to attack bathers, divers and even boats. Along the east coast, white sharks are occasionally seen scavenging on decomposing whale carcasses.

Economic importance: The white shark is too rare to be of economic importance. It is a great game fish because of its tremendous size and strength. Unfortunately, many are killed just for their jaws or teeth.

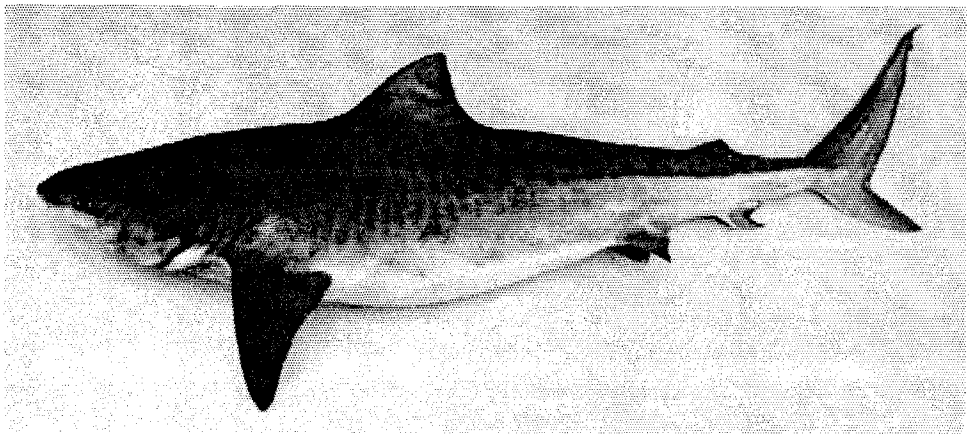
Fishing: White sharks are caught on shark and swordfish longlines, as well as in gill nets set in shallow water. Catches are usually a chance event.

Carcass: White sharks are rare in the landings, usually the fishermen recognize them. The carcass is proportionally very stout, has one caudal keel near caudal peduncle, it is brown to dark gray above, not blue or blackish like the makos, and has a dark band of muscle tissue along the midsides.



Cross section through white shark body showing muscle areas dark red.

TIGER SHARK (*Galeocerdo cuvieri*)



Recognition: The tiger shark is the easiest to identify of the requiem sharks because of its many diagnostic characteristics. It has a snout shorter than the width of the mouth, with long labial furrows around the corners of the mouth. The shape of the teeth is the best diagnostic characteristic; they have curved cusps with finely serrated edges, a deep notch on their outer margins, and they are similar in both jaws.

Color: Color varies from light gray to black above and from bluish or greenish gray above to dirty yellow or white below. Juveniles up to about 180 cm (71 in) have a mottled appearance, their dorsal surfaces are covered with dark spots on a lighter background. In larger sharks, the spots fuse together forming vertical bars or stripes producing a tiger-like appearance, hence the name. In older sharks the stripes tend to fade except in flanks near the tail.

Size: This is one of the largest sharks. Adults 335-425 cm (11-14 ft) are common. The largest specimens are believed to exceed 550 cm (18 ft) and 900 kg (2,000 lb). Such large specimens have become very rare in the last decade because of intensive fishing.

Similar species: The characteristic teeth and markings distinguish the tiger shark from all other requiem sharks.

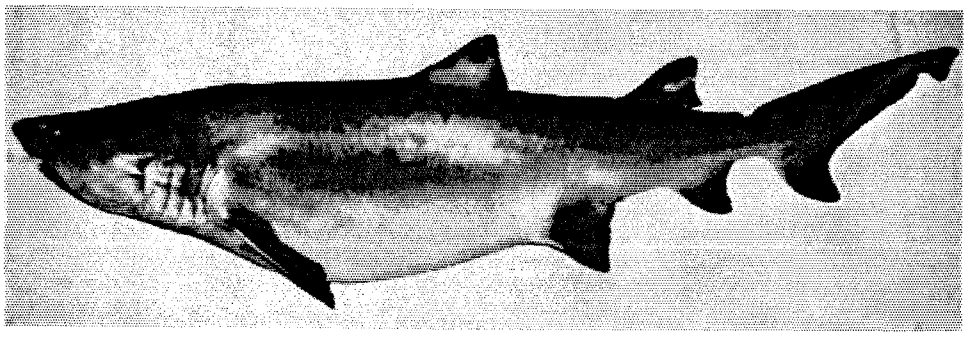
Biology: The tiger shark inhabits warm waters in both deep oceanic and shallow coastal regions. It feeds an all kinds of marine animals: turtles, horseshoe crabs, many bony fishes, smaller sharks, ray eggs cases, seagulls, just to name a few. It is also one of the few species of sharks that will scavenge dead animals (including humans). It is known to have attacked divers and swimmers.

Economic importance: Small specimens are often taken for food in directed shark fisheries. Larger specimens are finned in both direct shark fisheries and in tuna and swordfish operations.

Fishing: It is classed as a gamefish, providing lively sport due to its great size. Large hooks and baits are often used.

Carcass: The characteristic mottled markings of smaller fish, or the vertical dark bars of larger fish, and the presence of a week reinforcing keels around the caudal peduncle distinguish the tiger shark carcass from the other requiem sharks.

SAND TIGER SHARK (*Odontaspis taurus*)



Recognition: The sand tiger shark has the gill slits anterior to the origin of the pectoral fin, and a second dorsal fin almost as large as the first. The teeth have long, narrow, smooth-edged cusps with one (occasionally two) small lateral denticle on either side; the teeth are similar in both jaws.

Color: Color is light greenish gray above and grayish white below. Juveniles have yellowish brown spots.

Size: It reaches about 315 cm (10.4 ft).

Similar species: The lemon shark has similar coloration and two equally large dorsal fins but its teeth lack the lateral denticles, and has overlapping skin denticles.

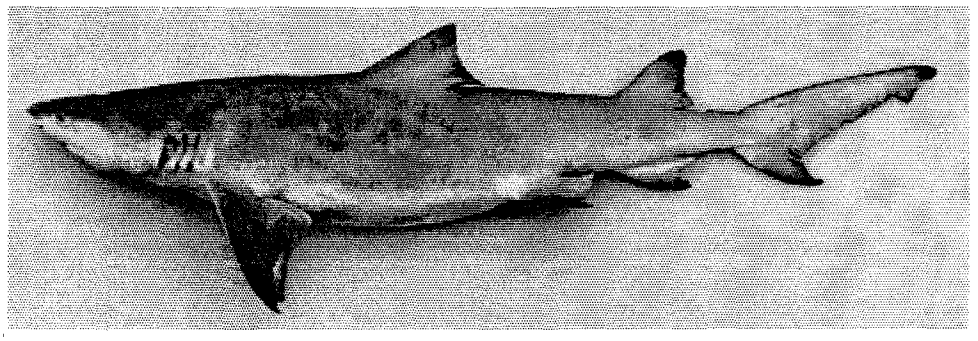
Biology: This is a common, bottom-dwelling shark usually found near shore, often in very shallow water. It can remain motionless on the bottom. It sometimes forms large aggregations over wrecks, probably for mating purposes. It ranges form the Gulf of Maine to Florida and the Gulf of Mexico.

Economic importance: Small numbers of sand tigers are found in both gillnet and coastal longline fisheries, but its numbers are too small to be of great economic importance.

Fishing: It is caught both in gillnets or on longlines set in very shallow waters. Occasionally large aggregations are caught over the mating areas.

Carcass: A greenish carcass without an interdorsal ridge, with two equally large dorsal fins (or cut marks), and nonoverlapping skin denticles.

LEMON SHARK (*Negaprion brevirostris*)



Recognition: The lemon shark has a snout shorter than the width of the mouth, and a second dorsal fin that is nearly as large as the first. The upper teeth have narrow, triangular, smooth-edged cusps, and broad, finely serrated bases. The lower teeth have narrow, triangular, smooth-edged, erect cusps.

Color: Color is yellowish green, brown, or olive gray, occasionally dark brown. The undersides are yellowish. The characteristic yellowish tinge gives it the name lemon shark.

Size: Specimens 240-300 cm (7.8-10 ft) are common. Maximum size is about 320 cm (10.5 ft)

Similar species: The bull shark has a similar snout but its second dorsal fin is much smaller than the first. The sand tiger shark has a similar color and also has two equally large dorsal fins, however, it has narrow needle-like teeth with smaller denticles on the side.

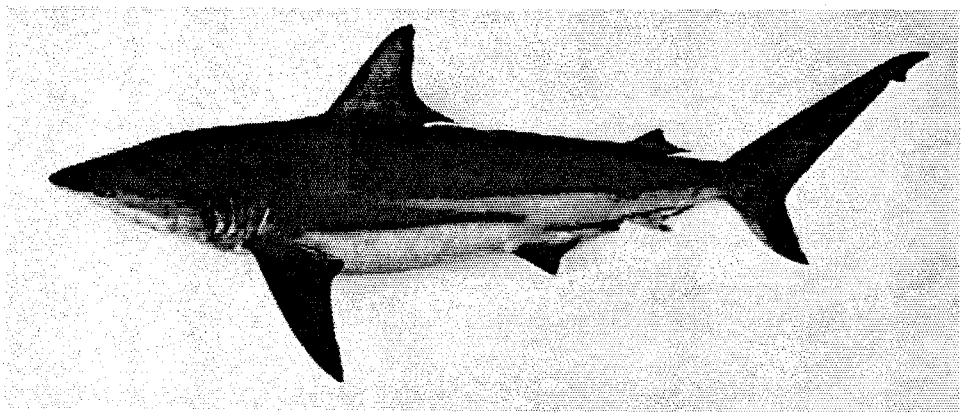
Biology: The lemon shark ranges from New Jersey to Brazil. It is common from the Carolinas to Florida and the Gulf of Mexico. It is a shore species; the young are very common around mangrove flats while adults are common in saltwater creeks, bays and sounds by night and in deeper coastal waters by day.

Economic importance: It is locally important in Florida shark fisheries where it is utilized for both its meat and fins. It is a popular aquarium species because it may survive a few years.

Fishing: It is normally caught at night in shallow coastal waters.

Carcass: The presence of two equally large fins (or fin cuts) and the characteristic yellowish color distinguish it from all other requiem sharks. Only the sand tiger shark has similar large dorsal fins and coloration. The easiest way to separate carcasses of these two species is to look at the skin denticles with a magnifying glass (a hand lens of about 10-15 power works best). Lemon shark carcasses can be distinguished from sand tiger carcasses by their overlapping denticles with three or more rearward points. Those of the sand tiger do not overlap and end in a single point.

BLACKTIP SHARK (*Carcharhinus limbatus*)



Recognition: In the blacktip shark, the dorsal and pectoral fins, and the lower lobe of the caudal fin are blacktipped. The anal fin is white. The first dorsal fin originates about the midpoint of the inner margin of the pectoral fin. It does not have an interdorsal ridge. The teeth have narrow triangular, erect, cusps with finely serrated edges.

Color: Color is dark gray to bluish gray above, with metallic hues in life, and with a band of the dorsal gray color extending rearward along the flanks. The undersides are white. The fins are blacktipped as explained above. In older specimens the black markings may be faded. Rarely almost unpigmented specimens are seen.

Size: Average size is about 150 cm (59 in). It grows to 180 cm (71 in)

Similar species: The lack of an interdorsal ridge and the black markings distinguish the blacktip shark from other requiem sharks in the area, except from the spinner shark. The spinner shark has the origin of the first dorsal fin over or posterior to the free rear tips, smooth edged teeth in the lower jaw, and the anal fin is blacktipped in specimens larger than 70 cm (28 in).

Biology: The blacktip shark inhabits shallow coastal waters and surface offshore waters. It ranges from New England (where it is rare) to Florida and the Gulf of Mexico. It is a fast moving shark often seen leaping and spinning out of the water. It feeds on schooling fishes.

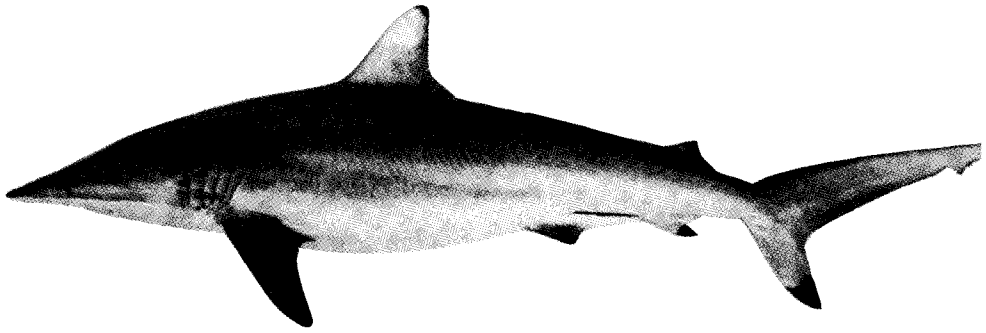
Economic importance: This is one of the most economically important species in the area. The species is targeted by many fishermen because of its high quality flesh, and because it can be caught in large schools that migrate close to shore. In recent times, the numbers of blacktip sharks appear to have decreased considerably, probably due to the vulnerability of the migrating schools.

Fishing: It is caught often in gill nets, in the very shallow coastal waters of its nursery areas in the summer, and in deeper coastal waters during the spring and fall migrations. It is also a great sport fish, often leaping out of the water when first hooked.

Carcass: The carcass can be recognized by lack of an interdorsal ridge, by the noticeable band of gray coloration extending into the white flanks, and a white anal fin. Most blacktips in southeastern waters bear prominent circular erosion marks of parasites around the base of the first dorsal fin or in between the dorsal fins (see carcass illustration in appendix).

Interdorsal ridge absent

SPINNER SHARK (*Carcharhinus brevipinna*)



Recognition: The spinner shark has a snout as long or longer than the width of the mouth, a first dorsal fin originating over or posterior to the free rear tips of the pectoral fins, and it lacks an interdorsal ridge. The upper teeth have narrow, triangular, erect cusps and wide bases in both jaws, the upper teeth have finely serrated edges, the lower teeth have smooth edges.

Color: Color is gray above, with bronze hues in life, and with a band of gray extending downward over the lighter sides from the level of the pectoral fins to over the pelvic fins. The undersides are white. Young specimen under 70 cm (28 in) have unmarked fins. Older specimens have the second dorsal, anal, pectoral, and the lower caudal lobe of the caudal fin black-tipped.

Similar species: The blacktip shark has a white anal fin. The finetooth shark has a shorter snout, smooth-edged upper teeth, a first dorsal originating over the pectoral axil, and unmarked fins.

Biology: The spinner shark is circumtropical. In North America it ranges from North Carolina to Florida and the Gulf of Mexico. It is found both in inshore and offshore waters. It is often seen pursuing school of small fishes and leaping out of the water.

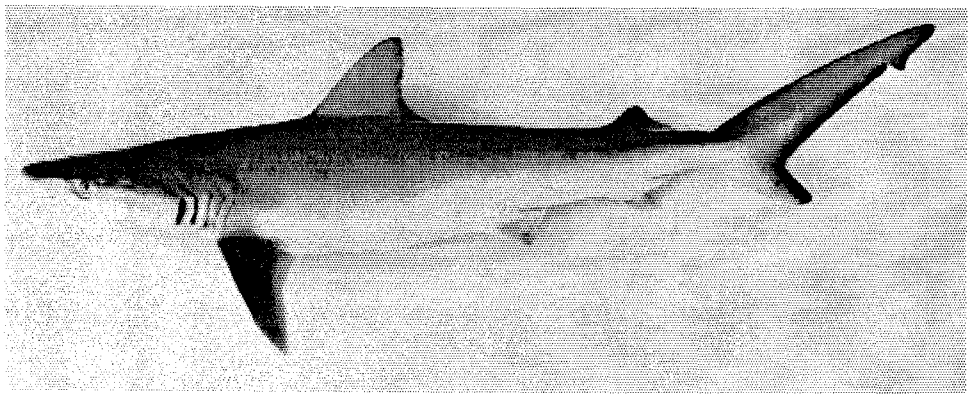
Economic importance: It is often marketed fresh along with blacktip shark.

Fishing: It is caught both in commercial longlines as well as on rod and reel.

Carcass: The carcass lacks an interdorsal ridge and has a band of gray extending downward over the lighter sides and a black-tipped anal fin.

Interdorsal ridge absent

BLACKNOSE SHARK (*Carcharhinus acronotus*)



Recognition: The blacknose shark has a snout as long as, or longer, than the width of the mouth, and a first dorsal fin originating over or behind the free rear tips of the pectoral fins. It lacks an interdorsal ridge. The upper teeth have narrow, oblique cusps strongly notched on their outer margins, with serrated edges that become progressively coarser towards the bases. The lower teeth have narrow, erect, symmetrical cusps, more finely serrated than the upper teeth.

Color: Color is greenish gray, sometimes yellowish gray or brown above, the undersides are yellowish or paler. There is a dusky blotch at the tip of the snout, distinct and dark in the young, diffuse and dusky in the adults.

Size: Average size is 125 cm (49 in) and 10 kg (22 lb). It grows to 160 cm (63 in).

Similar species: The bull shark has a shorter snout, its teeth lack the strong notch, and it lacks the dark spot on the nose.

Biology: The blacknose shark is found from North Carolina to Brazil. It is a coastal species that preys on small fishes.

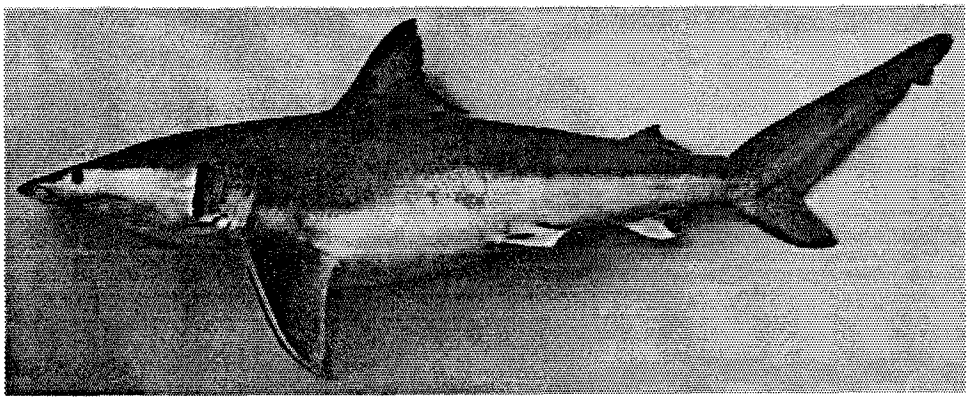
Economic importance: Although it is sometimes caught in large numbers by shallow water fisheries, it is generally too small to be of much value.

Fishing: It is often caught in large numbers in shallow water gillnets and longlines.

Carcass: A small (less than 90 cm) carcass, without an interdorsal ridge, greenish gray in color and without any white spots.

Interdorsal ridge absent

FINETOOTH SHARK (*Carcharhinus isodon*)



Recognition: The finetooth shark has a snout shorter than the width of the mouth, and it lacks an interdorsal ridge. The teeth have erect, smooth-edged cusps and broad bases, and are similar in both jaws.

Color: Color is bluish gray above and white below. The fins are unmarked. After death the color changes to a very dark bluish gray.

Size: Maximum size is about 160 cm (63 in).

Similar species: The lemon shark has a second dorsal fin that is almost as large as the first, and has a yellowish tinge. The blacktip shark has finely serrated teeth and blacktipped fins. The spinner shark has upper teeth with finely serrated bases and it has blacktipped fins.

Biology: The finetooth shark inhabits the western Atlantic from North Carolina to Brazil. It is common from South Carolina to the GUlf of Mexico. It is coastal species that inhabits shallow coastal waters. In the northern part of the range it is found in shallow water 3-6 m (1-3 fathoms).

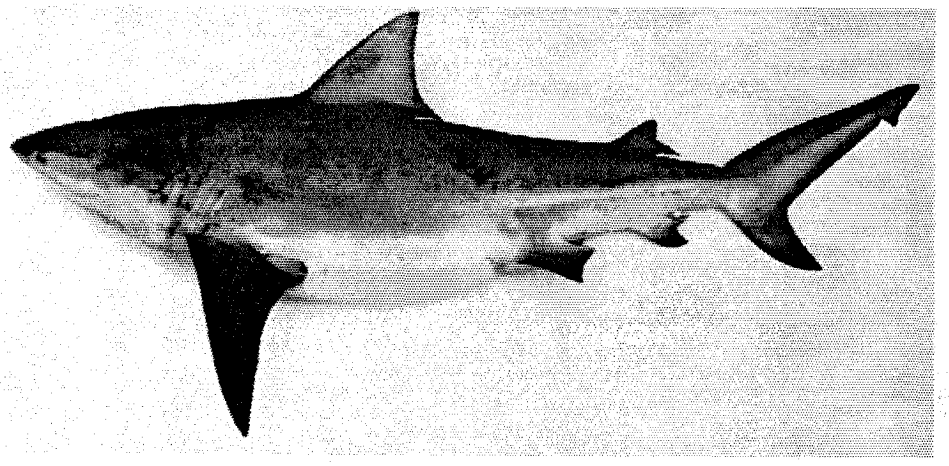
Economic importance: It is locally important in gill net fisheries in very shallow waters off South Carolina because it is very abundant there.

Fishing: It is usually caught in gill nets set close to shore. The young are occasionally caught in shrimp trawls.

Carcass: The carcass is bluish black, the upper coloration extends uniformly along the flanks, lacks an interdorsal ridge.

Interdorsal ridge absent

BULL SHARK (*Carcharhinus leucas*)



Recognition: The bull shark has an extremely short snout, much shorter than the width of the mouth, a first dorsal fin with pointed apex, and second dorsal fin much smaller than the first. It lacks an interdorsal ridge. The upper teeth have broadly triangular, heavily serrated cusps, the lower teeth have narrow, triangular, finely serrated cusps.

Color: Color is pale to dark gray above and white below. Newborn and very small juveniles.

Size: Average size is about 230 cm (7.5 ft) but it is said to grow to 350 cm (11.5 ft).

Similar species: The oceanic whitetip has a similar snout and teeth, but the tips of its first dorsal and pectoral fins are broadly rounded. The lemon shark has a second dorsal fin that is almost as large as the first.

Biology: The bull shark is cosmopolitan in warm waters. In North America it ranges from New York to Florida and the Gulf of Mexico. It is a common shallow-water species found in estuaries, harbors, and creeks. It often enters fresh water, sometimes penetrating hundreds of miles upstream.

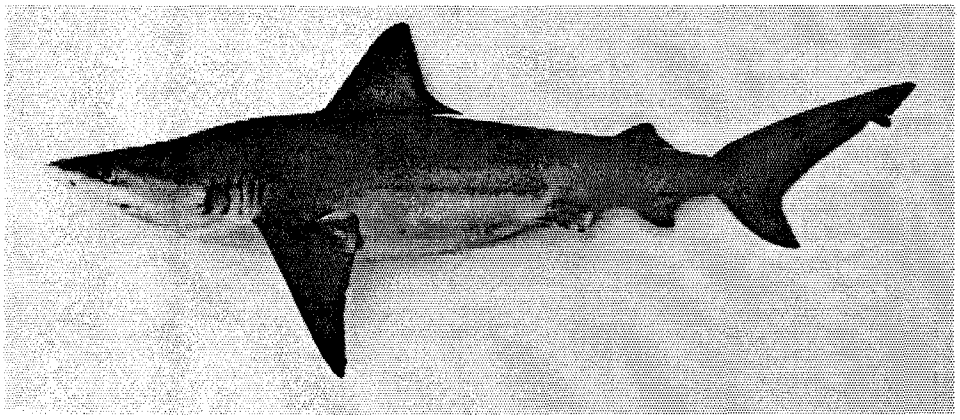
Economic importance: The species is important in coastal shark fisheries in the Gulf of Mexico.

Fishing: It is mainly caught in coastal longlines.

Carcass: Any very large, unmarked, brownish gray carcass lacking an interdorsal ridge, coming from coastal fisheries, is likely to be a bull shark. The fins from large specimens have denticles that are large enough to be seen with the naked eye. Any large shark caught in fresh water is most likely a bull shark. The blacknose shark has a greenish tinge.

Interdorsal ridge present

BIGNOSE SHARK (*Carcharhinus altimus*)



Recognition: The bignose shark has a snout as long as, or longer, than the width of the mouth, a first dorsal fin originating over or almost behind the pectoral axil almost to the midpoint of the inner pectoral margin, and a marked interdorsal ridge. Its front teeth are broadly triangular, without any notch on their outer margins, and with overlapping serrated cusps. The teeth on the sides have oblique almost curved cusps. The skin denticles are non-overlapping.

Color: Color is gray above fading to white below.

Size: Average size is 240 cm (94 in); it grows to, at least, to 282 cm (111 in).

Similar species: The sandbar shark has a shorter snout and a higher first dorsal fin. The silky and dusky sharks have the origin of the first dorsal fin over the free rear tip of the pectoral fin. The Galapagos shark has a shorter snout.

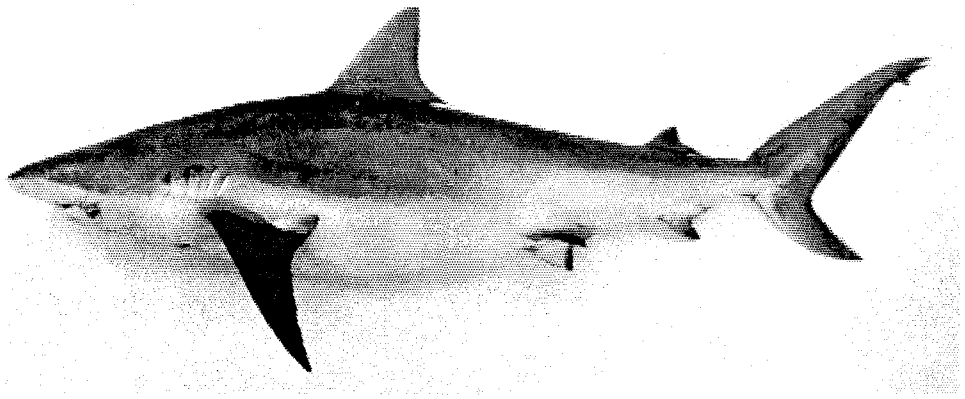
Biology: The bignose shark is found in tropical and subtropical oceans throughout the world. It is common in deep water 90-430 m (50-235 fathoms) off Florida, but it occasionally strays into shallower water during incursions of cool water.

Economic importance: It is extensively used throughout the Caribbean.

Fishing: It is occasionally caught in coastal shark fisheries and in swordfish fisheries.

Carcass: A ridgebacked carcass with a second dorsal fin as high as the length of its free rear tip and non-overlapping skin denticles. Of the ridgebacked sharks found in our commercial fisheries only the bignose and the sandbar have non-overlapping denticles.

CARIBBEAN REEF SHARK (*Carcharhinus perezii*)



Recognition: The Caribbean reef shark has a snout shorter than the width of the mouth, a first dorsal fin originating over the free rear tips of the pectoral fins, a second dorsal fin with a very short free rear tip (its inner margin is shorter than or equal to the height of the fin), and an interdorsal ridge. The upper teeth have narrow cusps with serrated edges and broad bases, the from two or three teeth on each side of the jaw are erect, the others are increasingly oblique. The lower teeth have narrow erect cusps with serrated edges and broad bases.

Color: Color is light brown to brownish gray above, with bronze or copper hues in life, and white below. Young specimens have black or dusky-edged fins.

Size: It grows to about 295 cm (115 in).

Similar species: The dusky, Galapagos, sandbar, and bignose sharks have broadly triangular upper teeth. The silky shark has teeth with larger serrations at the base.

Biology: The Caribbean reef shark inhabits the southeastern coast of Florida, the Caribbean, and the western Atlantic south to Brazil. It is a bottom dwelling species found around coral reefs.

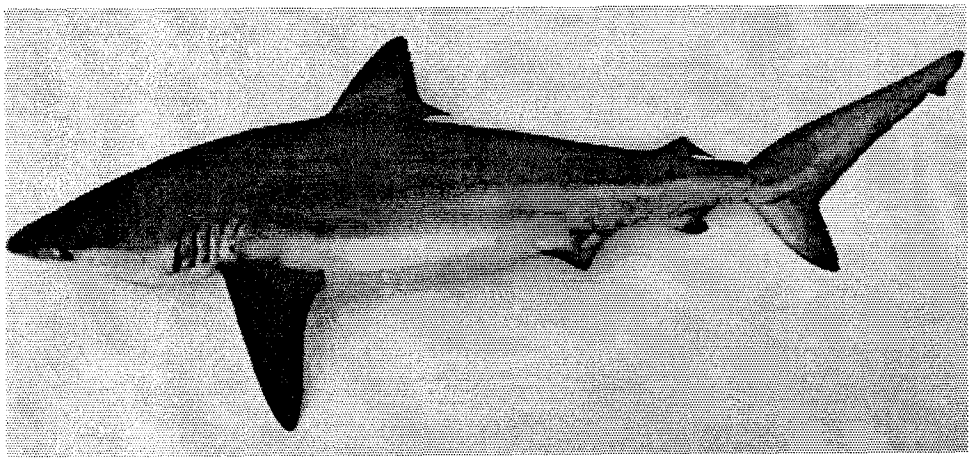
Economic importance: It is often found in Caribbean markets but few specimens are seen in U.S. markets.

Fishing: It is usually caught in longlines set in shallow water around reefs.

Carcass: Carcasses are seldom seen in U.S. markets. The only area where Caribbean reef sharks are to be expected is in south Florida. Separation of carcasses of reef sharks and dusky sharks is problematic at this time. Its brown color is often a clue to its identity.

Interdorsal ridge present

DUSKY SHARK (*Carcharhinus obscurus*)



Recognition: The dusky shark has a snout shorter than, or as long as, the width of the mouth, a sloping first dorsal fin originating over or slightly anterior to the free rear tips of the pectoral fins, and a marked interdorsal ridge. The upper teeth are broadly triangular with serrated edges. The lower teeth have narrow, nearly erect cusps, with more finely serrated edges than the upper teeth.

Color: Color is blue to gray above, white below.

Size: It reaches up to 364 cm (11.9 ft).

Similar species: The sandbar shark, which is often confused with the dusky, has a much higher and more anteriorly placed first dorsal fin, with its origin over the pectoral axil. Sandbar and bignose sharks have non-overlapping dermal denticles (scales), while those of the dusky are closely set to each other and overlap each other. The sandbar denticles have no definite teeth on their rear margins while those of the dusky have very definite teeth. The bignose shark denticles are widely separated from each other while those of the dusky overlap so closely that the margins of individual denticles are not seen easily. The Galapagos shark is very similar to the dusky. It is difficult to separate the two without direct comparison. Very small specimens are very difficult to tell apart by sight alone; medium and large specimens are more easily separated by the larger teeth and more erect first dorsal fin of the Galapagos shark. However, it is easy to separate the two species by the number of precaudal vertebrae present: 103-109 in the Galapagos and 86-97 in the dusky. So, in case of doubt, the backbone must be exposed from the back of the skull to the base of the tail, and the vertebrae counted.

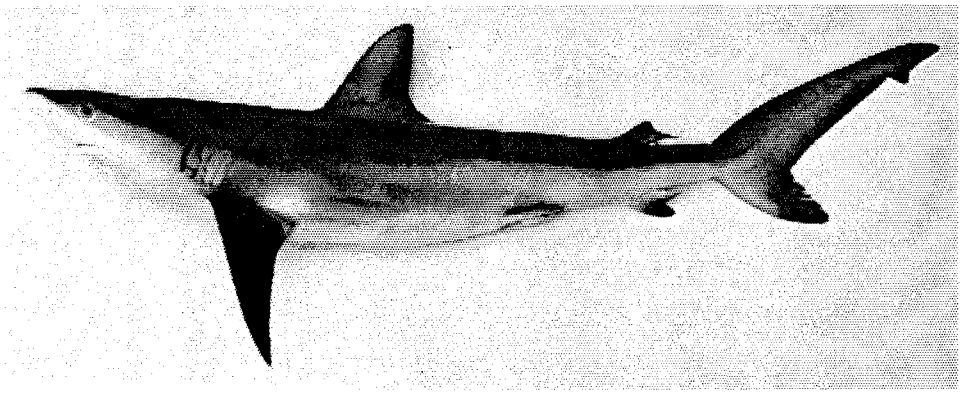
Biology: The dusky shark is cosmopolitan in warm waters. Along our east coast it ranges from Georges Bank to Florida and the Gulf of Mexico. This is one of the larger species inhabiting continental waters, from inshore waters to the outer reaches of the continental shelf. It feeds on numerous bony fishes and smaller sharks

Economic importance: The dusky is an economically important species in coastal fisheries. In the past, the medium size specimens were much sought by commercial fishermen. The larger specimens were not so desirable because their flesh brought only much reduced prices, and many fishermen released many large duskies that remained as breeding stock. Today, because the high prices of shark fins (over $40/kg), large duskies are relentlessly killed only for their fins, much to the detriment of the stocks.

Fishing: Dusky sharks are caught on longlines and in gillnets in coastal fisheries.

Carcass: In coastal fisheries, ridgebacked carcasses over 80 lb are usually dusky sharks. Because of their unwieldy size, large dusky carcasses are often cut into two or three sections. Sandbar sharks and dusky sharks are often caught together in coastal fisheries. Separating small, intact sandbar and dusky sharks, can be difficult for the uninitiated, and identifying their carcasses is more challenging. The non-overlapping skin denticles of the sandbar shark offer the easiest method of separation.

GALAPAGOS SHARK (*Carcharhinus galapagensis*)



Recognition: The Galapagos shark has a snout shorter than the width of the mouth, a first dorsal fin originating over or posterior to the midpoint of the inner margin of the pectoral fin, and a marked interdorsal ridge. The upper teeth have broadly triangular cusps and serrated edges; the lower teeth are symmetrical and erect and have very fine serrations near the point. It has 14 teeth on each side of both the upper and lower jaws, not counting the small tooth in the center of the jaw.

Color: Color is brown above and white below.

Size: It grows to at least 330 cm.

Similar species: The Galapagos and the dusky shark are difficult to separate without direct comparison.

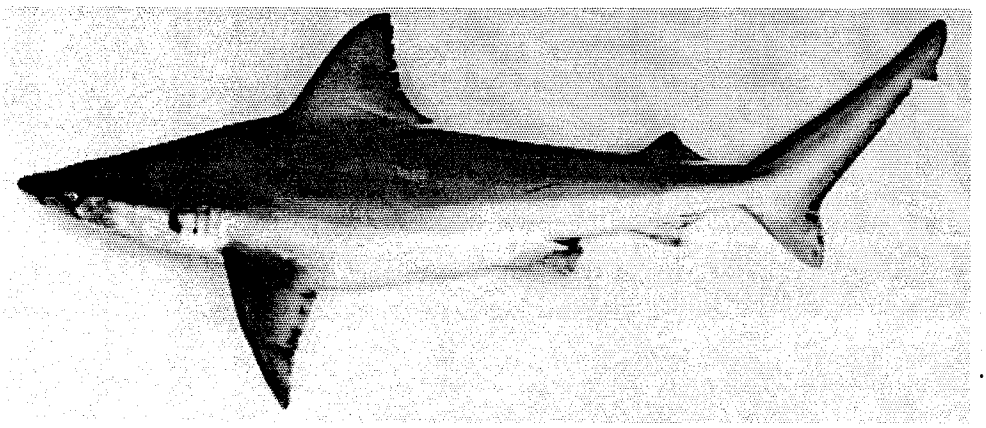
Biology: The Galapagos shark inhabits the waters around tropical oceanic islands, where it is often the most abundant or the sole species of shark. It is occasionally found in the open ocean and along continental shores.

Economic importance: Very small numbers of Galapagos sharks are caught each year along the FLorida coast. They are usually reported and marketed as dusky sharks.

Fishing: The few specimens that have positively identified as Galapagos sharks came from shark longline fisheries off Florida.

Carcass: The only way, at present, to separate Galapagos and dusky shark carcasses is to count the vertebrae, which requires removing the entire backbone. Precaudal vertebrae number 103-109 in the Galapagos shark, and 86-97 in the dusky.

SANDBAR SHARK (*Carcharhinus plumbeus*)



Recognition: The sandbar shark has a snout shorter than the width of the mouth, a large first dorsal fin originating over the axil of the pectoral fin, its height equal or greater than twice the snout length, and a low interdorsal ridge. The upper teeth have broadly serrated cusps with finely serrated edges; the frontal teeth are erect, and the others are oblique with curved margins.
The lower teeth have narrow, triangular cusps with more finely serrated edges than the upper teeth. Its widely spaced, non-overlapping skin denticles without teeth on their free edges are also diagnostic.

Color: Color is bluish gray, brownish gray, or brown above, often with slight metallic hues in life, and whitish below.

Size: It grows to about 240 cm TL (94 in) but specimens over 220 cm (87 in) are uncommon.

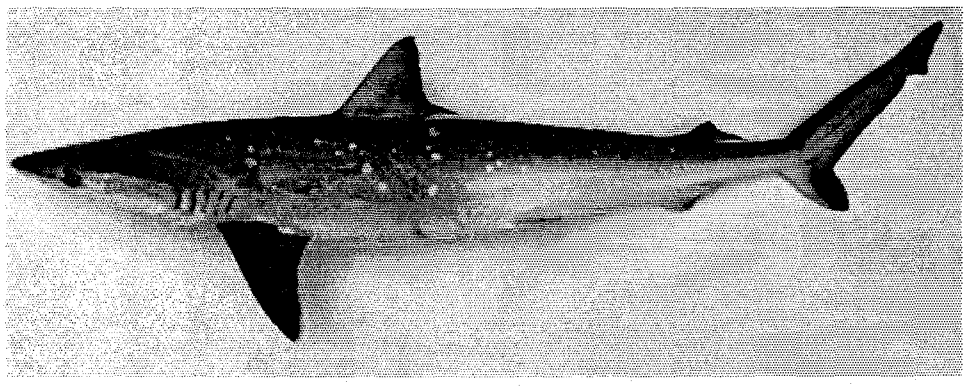
Similar species: The dusky shark and the Galapagos shark have the origin of the first dorsal fin placed further back over the free rear tips of the pectoral fins, and have overlapping skin denticles. The bignose shark has a longer snout (its length is equal or greater than the width of the mouth), and has a smaller first dorsal fin. The bull shark lacks the interdorsal ridge.

Biology: This is common inhabitant of shallow coastal waters and estuaries. It is a bottom-dwelling species usually found in 10-30 fathoms) but occasionally found in 100-135 fathoms. It is a migratory species ranging from New York to Florida and the Gulf of Mexico.

Economic importance: Its great abundance and size make it the most sought after species of shark in the commercial fisheries of the east coast, thus, it is the most economically important species.

Carcass: Sandbar carcasses should be identified by the presence of and interdorsal ridge and by their non-overlapping skin denticles. The bignose shark is the only other species with small, non-overlapping skin denticles. Sandbar carcasses seldom exceed 65 lb. Most ridgebacked carcasses over 65 lb., from coastal fisheries, are dusky sharks.

ATLANTIC SHARPNOSE SHARK (*Rhizoprionodon terraenovae*)



Recognition: The Atlantic sharpnose shark is smaller than 120 cm (48 in), it has a snout longer than the width of the mouth, and long labial furrows around the corners of the mouth. Its teeth are triangular, oblique, strongly notched on their outer margins, smooth-edged, and similar in both jaws.

Color: Color is brownish gray or olive gray above, with metallic hues along the sides in life, shading to white below. The adults have a few scattered white spots on the dorsal surfaces. The young have black-edged dorsal and caudal fins.

Size: Average size is 95 cm (37 in) and 3.6 kg (8 lb). It grows to about 120 cm (47in).

Similar species: The combination of long snout, labial furrows and notched teeth distinguish it from the other requiem sharks in the area.

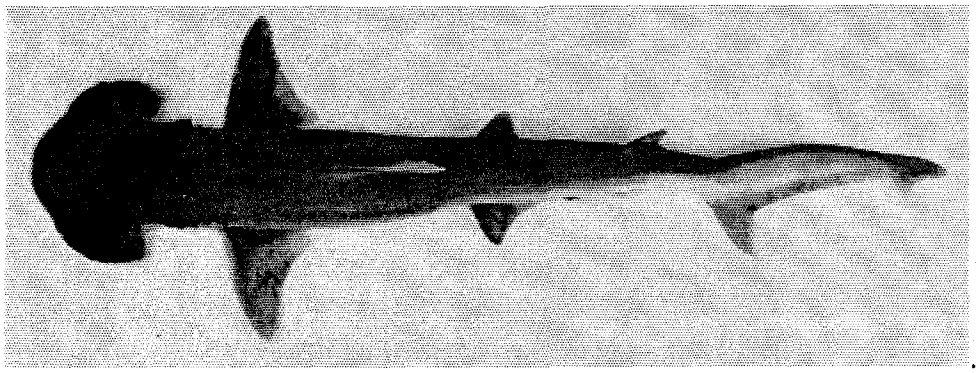
Biology: The Atlantic sharpnose shark inhabits the northeastern coast of North America from the Bay of Fundy south to Yucatan. It is common from North Carolina to Florida and the Gulf of Mexico. It is very abundant in coastal waters in the summer, often forming large schools of individuals of the same size and sex.

Economic importance: It is locally important in coastal and shallow water fisheries because of its abundance. It is often a nuisance to fishermen seeking larger game. It is a fun fish to catch on light tackle.

Fishing: Very large numbers are caught in shrimp trawls off South Carolina and Georgia. It is easily caught on cut bait over "live bottoms", providing hours of continuous action for the sportsman. It is easily caught in longlines baited with small hooks in shallow water from the Carolinas to Florida and the Gulf of Mexico.

Carcass: Adult carcasses are easily identified by their small size less than 95 cm (37 in), and by the presence of scattered white spots and spineless dorsal fins. The young are usually not dressed because of their small size and are sold whole (See Recognition above).

BONNETHEAD (*Sphyrna tiburo*)



Recognition: The characteristic shovel- or bonnet-shaped head makes this hammerhead the easiest to identify. The anterior margin of the head is evenly rounded between the eyes.

Color: Color is brownish or greenish gray above with scattered small black or dark spots, and pale or light tan below.

Size: It grows to about 122 cm (48 in).

Similar species: All the other hammerheads have hammer-shaped (not shovel-shaped) heads.

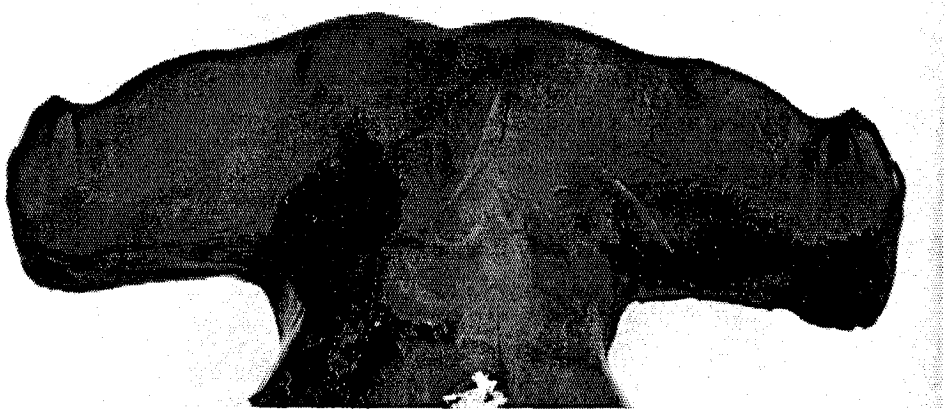
Biology: This little hammerhead inhabits warm, shallow coastal waters throughout the western hemisphere. In our area, it is found from New England, where it is rare, to the Gulf of Mexico. It is found in very shallow coastal waters over sandy or muddy bottoms. It feeds on crabs, shrimp, mollusks, and small fishes.

Economic importance: It is occasionally marketed, but it is of little economic importance. Its small size and shallow water habit keep it from most shark fisheries.

Fishing: Most bonnetheads are caught over sandy bottoms. Most specimens are caught in shallow water gillnet fisheries.

Carcass: A small carcass less than 75 cm (36 in), with small dark or black spots, usually coming from shallow water net fisheries.

SCALLOPED HAMMERHEAD (*Sphyrna lewini*)



Recognition: The scalloped hammerhead has a marked central indentation on the anterior margin of the head, which gives it a "scalloped" look, a long and low second dorsal fin (its length is about twice the height of the fin) which almost reaches the precaudal pit. The rear margin of the pelvic fins is straight. The teeth are triangular, smooth-edged (often weakly serrated in large individuals), and similar in both jaws. The front teeth are erect, while subsequent teeth have oblique cusps.

Color: Color is deep olive to brownish gray above, shading to white below. The ventral tips of the pectoral fins are dusky or black.

Size: It grows to about 365 cm (12 ft.)

Similar species: The great hammerhead has teeth with serrated edges and pelvic fins with curved rear margins. The smooth hammerhead lacks the central indentation on the anterior margin of the head.

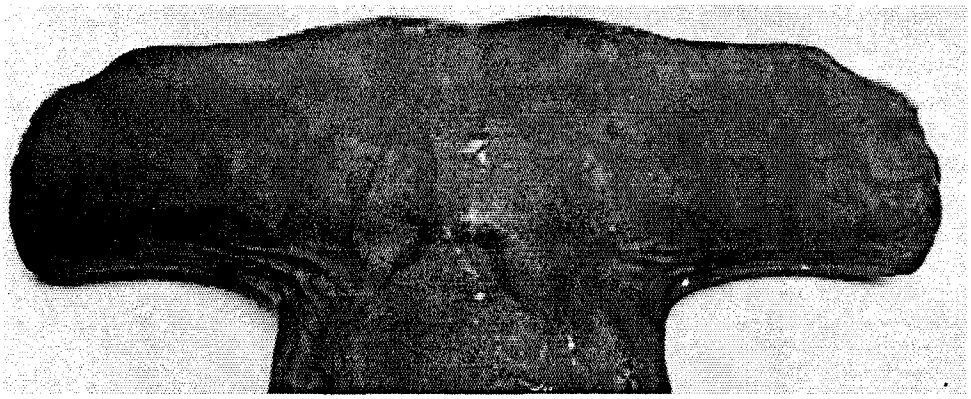
Biology: This is a warm water species seldom found in water cooler than 22° C (72° F). It is a common species found both in coastal and in oceanic waters. It is cosmopolitan in warm waters. In our area, it ranges from New Jersey to Florida and the Gulf of Mexico.

Economic importance: Although the scalloped hammerhead is one of the more commonly taken sharks by both coastal and pelagic fisheries, its flesh is not usually utilized because dealer and consumer bias against its slightly darker flesh. Its fins are valuable, so most scalloped hammerheads taken in commercial fisheries are finned and the carcasses are discarded.

Fishing: Large numbers of adult scalloped hammerheads are taken by both pelagic and coastal longline fisheries. Small juveniles are often taken in shrimp trawls and in coastal gillnets.

Carcass: Hammerhead carcasses are not usually landed because there is little demand for their flesh. Hammerheads are usually finned and the carcasses are discarded. Hammerhead carcasses can be identified by the darker flesh. The second dorsal fin free rear tip is as long as the height of the fin. The scalloped hammerhead caudal peduncle is nearly oval in cross section; that of the smooth hammerhead is nearly round, and that of the great hammerhead is more rectangular with scalloped edges (See illustration on next page).

GREAT HAMMERHEAD (*Sphyrna mokarran*)



Recognition: The great hammerhead is characterized by a nearly straight anterior margin of the head (slightly rounded in very young specimens) with a deep central indentation, and by pelvic fins with curved rear margins. The teeth are triangular with strongly serrated edges, with cusps that become increasingly oblique towards the corners of the mouth.

Color: Color varies from olive green to brownish gray above, shading to white below.

Size: This is the largest of the hammerheads and it is reputed to reach 610 cm (20 ft).

Similar species: All the other hammerheads lack the strongly serrated teeth and the pelvic fins with curved rear margins.

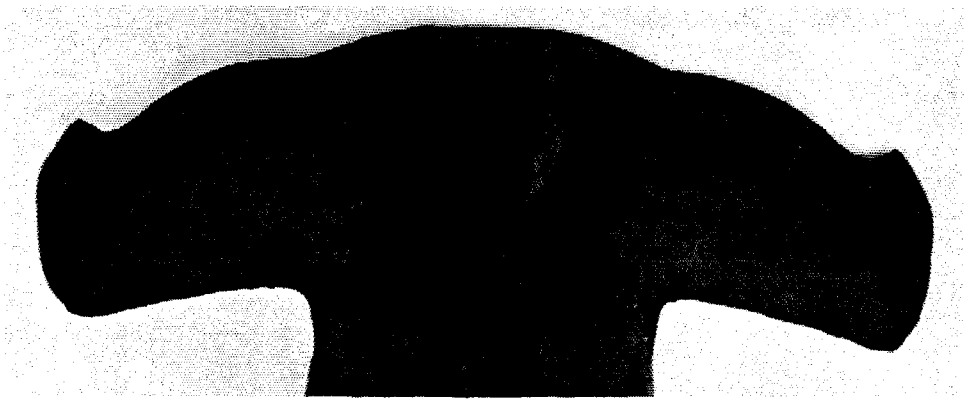
Biology: This large shark is circumtropical and can be found in both the open ocean and in shallow coastal waters. It ranges from North Carolina to Florida and the Gulf of Mexico. Most great hammerheads seen off the U.S. east coast are very large specimens (larger than 240 cm). Juveniles are seldom seen in our area.

Economic importance: The flesh, like that of other hammerheads, is not utilized in the U.S.A. because dealer and consumer bias against its darker flesh. Its very large fins are among the most valuable.

Fishing: It is caught both in inshore and offshore longline operations.

Carcass: Hammerhead carcasses are not usually landed because there is little demand for their flesh. Great hammerheads are usually finned and the carcasses are discarded. Carcasses of this species can be usually differentiated from other hammerheads by their much larger size. The caudal peduncle of great hammerheads is about 180 mm (6 in) from top to bottom, a size seldom reached by the other species. It is also more rectangular than those of the scalloped and smooth hammerheads.

SMOOTH HAMMERHEAD (*Sphyrna zygaena*)



Recognition: The smooth hammerhead is identified by the anterior margin of the head that lacks a central indentation, hence the name "smooth". The rear margins of the pelvic fins are straight. The teeth have smooth-edged, oblique cusps with a notch on the outer margin, and are similar in both jaws.

Color: Color is variable, ranging form dark olive gray to blackish brown above, shading to white below.

Size: It is reputed to grow to 396 cm (13 ft.)

Similar species: The anterior margin of the head without a central indentation distinguishes it from the other hammerheads, except for the bonnethead which has a shovel-shaped head.

Biology: This is a surface dwelling species found in waters much cooler that those inhabited by scalloped and great hammerheads.

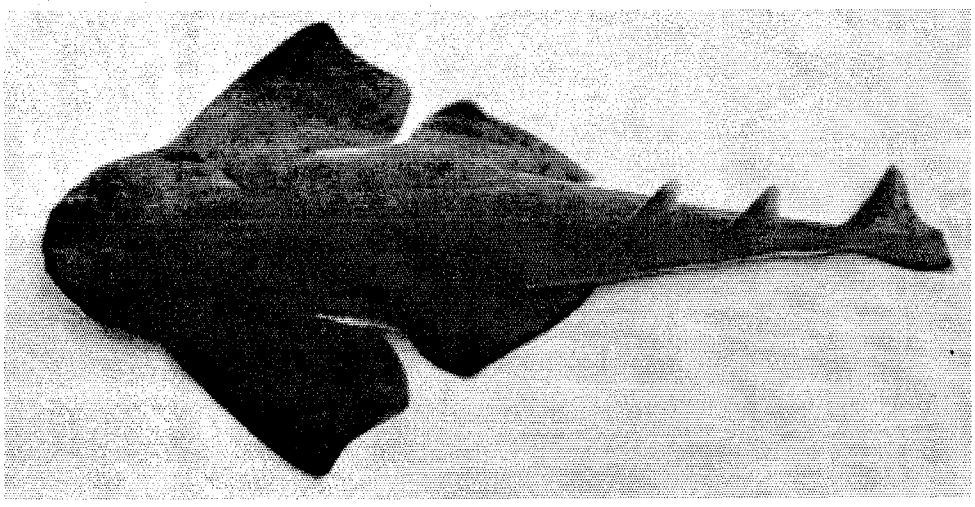
Economic importance: It appears to be caught in much smaller numbers than the scalloped and great hammerheads. There is little information in the numbers of smooth hammerheads taken for their fins.

Fishing: It is occasionally caught in coastal longlines.

Carcass: Hammerhead carcasses are not usually landed because there is little demand for their flesh. Hammerheads are usually finned and the carcasses are discarded. Hammerhead carcasses can be identified by the darker flesh. The second dorsal fin free rear tip is much longer than the height of the fin. The caudal peduncle is nearly round.

Cross sections through the caudal peduncle at the base of the tail: smooth hammerhead (left) and scalloped hammerhead (right).

ATLANTIC ANGEL SHARK (*Squatina dumerili*)



Recognition: This is our only flattened ray-like shark. it is often mistaken for a ray or a skate. It is distinguished from the rays in having the pectoral fins separated from the head, whereas in the skates and rays the pectoral fins are fused to the head. It has a flattened body, a terminal mouth, eyes on top of the head, large spiracles just behind the eyes, greatly expanded pectoral fins, and two equally small dorsal fins located near the tail.

Color: Color varies from light gray to reddish brown above with irregular brown splotches. The undersides are whitish.

Size: Most specimens in the fishery measure 90-122 cm (34-48 in) and weigh 10-27 kg (22-60 lb).

Similar species: The skates and rays have pectoral fins fused to the head.

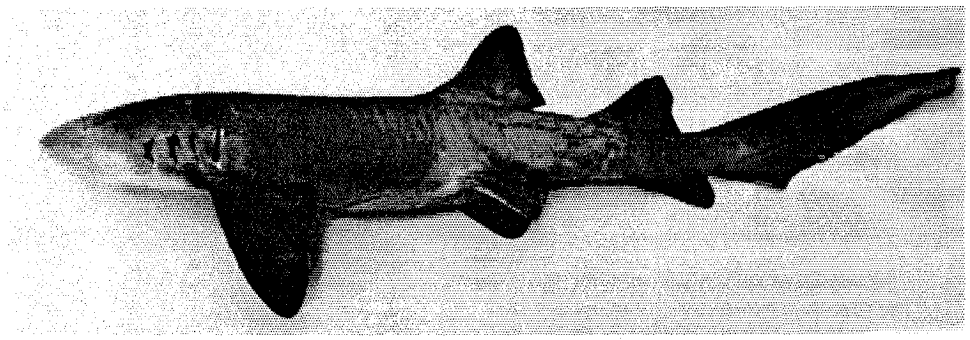
Biology: The angel shark is found from Massachusetts to the Florida Keys. It is common in the northern parts of its range. This is a poorly known bottom-dweller usually found buried in the bottom.

Economic importance: Small amounts of angel sharks are found in east coast markets.

Fishing: It is usually an accidental catch in trawls.

Carcass: The flattened, ray-like carcass can not be mistaken for any other shark.

NURSE SHARK *(Ginglymostoma cirratum)*



Recognition: A shark with a terminal mouth, with a conspicuous whisker-like nasal barbel on each side of the mouth, and a first dorsal fin originating over or posterior to the origin of the pelvic fins.

Color: Color is dark to light brown above and lighter below, occasionally with a yellowish tinge in the undersides.

Size: Adults measure 230-300 cm (7-10 ft). It is believed to reach 425 cm (14 ft).

Silar species: The nurse shark is the only Atlantic shark with long, tapering nasal barbels.

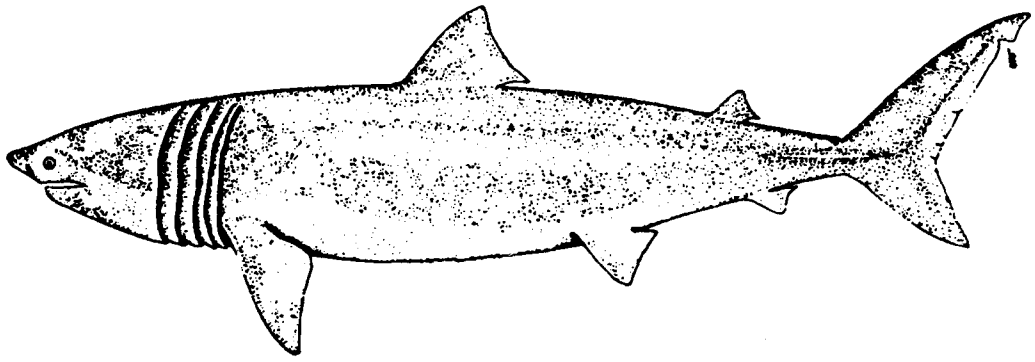
Biology: In the western Atlantic the nurse shark is found from off Cape Hatteras to off Brazil. It is a coastal species often found in, or close to, coral reefs. The young are found in very shallow water in south Florida, with progressively larger adults being found in progressively deeper waters.

Economic importance: Its hide is said to be one of the best for the production of leather. It is not utilized for food or for its fins.

Fishing: Many adults are caught in coastal shark fisheries off FLorida, they are usually spared and released unharmed. Nurse sharks are incredibly strong and tenacious, thus experienced fishermen prefer to cut the line to bringing a live nurse shark on deck.

Carcass: The brown color and presence of large dorsal fins located posterior to the origin of the pelvic fins serve to separate the nurse from other sharks in the area.

BASKING SHARK (*Cetorhinus maximus*)



Recognition: The basking shark, usually an enormous shark, has a conical snout, enormous gill slits that extend from the back to the midline, with bristle like gill rakers inside the gill slits, strong caudal keels on the tail, and a lunate tail.

Color: Color is grayish brown to slaty gray above, uniformly throughout or with lighter, irregular patches; the undersides are paler.

Size: This is the second largest fish in the oceans (Only the whale shark is larger). The largest measured specimen reached 980 cm (32 ft). Larger basking sharks have been reported without supporting evidence.

Similar species: Large white sharks in the water appear uniformly colored while basking sharks usually present a mottled appearance. The whale shark has white spots and stripes on the dorsal side.

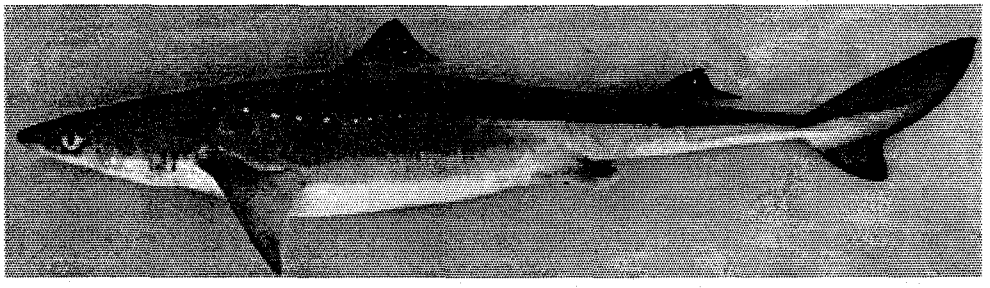
Biology: This is a filter feeding, plankton eating, gigantic shark often seen swimming slowly on the surface with the mouth wide open and the dorsal fin exposed. It is primarily a species of the subpolar and temperate zones, being found along the Atlantic states only during the winter months.

Economic importance: In the past, it was pursued in Europe for its liver oil. The species is not used commercially in the U.S. It is often considered a nuisance because it often becomes entangled in nets, often causing great damage while trying to escape.

Fishing: It is generally taken by harpoon, specimens generally being indifferent to baited hooks. Most specimens seen are entangled in nets set close to shore.

Carcass: Basking sharks are not landed or processed by U.S. fisheries at this time.

SPINY DOGFISH (*Squalus acanthias*)



Recognition: A shark with no anal fin, spines at the bases of both dorsal fins, with small white spots scattered over the body, and a second dorsal fin considerably smaller than the first.

Color: Color is slate gray or brownish gray above with small white dots scattered over the body. An albino from Norway has been reported.

Size: Average size is 75-105 cm (30-40 in). Maximum size is about 130 cm (51 in).

Similar species: There are several deep water species of dogfishes that are similar to the spiny dogfish. Those species lack the white dots as adults (Small spiny dogfish do not have them). CK

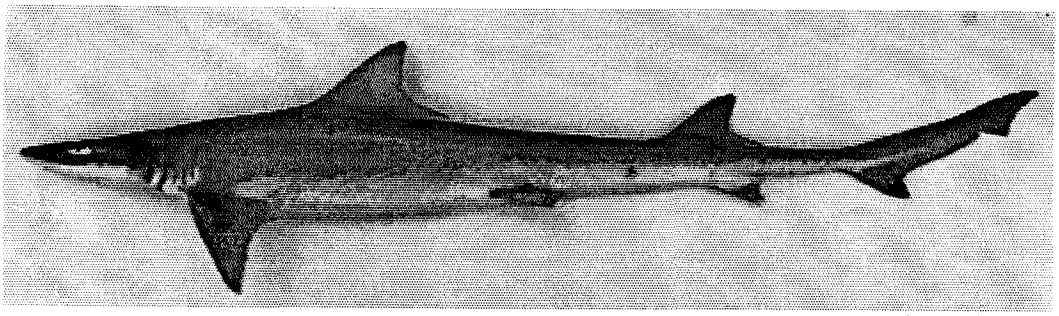
Biology: The spiny dogfish is the most abundant and the best known shark off the North American coasts. In our area it ranges from Newfoundland to North Carolina (occasionally to South Carolina in cold winters). It forms highly localized, very large schools, usually composed of sharks of uniform size and sex, that migrate north and south along the coast. The migration are controlled by temperature as the dogfish prefers waters of 6-11°C (43-52°F). It is found from the surface to depths of (400 fathoms) or more. It is the only member of its family that regularly enters shallow or surface waters; the other dogfishes are confined to deep water.

Economic importance: In the past the spiny dogfish was fished for its liver oil which was used as a lubricant and for the extraction of vitamins. Nowadays it is used for reduction into fishmeal for animal food and for human consumption. Its flesh is quite palatable but only small amounts are found in American markets.

Fishing: Wherever it is present the spiny dogfish is easily caught on both hook and line or in trawled nets. It is often a nuisance to those fishing for other species. When the dogfish are present, it is often difficult to catch anything else.

Carcass: Any small carcass with spines at the base the dorsal fins, and with white dots scattered over the body is a spiny dogfish.

SMOOTH DOGFISH OR SMOOTH-HOUND (*Mustelus canis*)



Recognition: The smooth dogfish has a very slender body, a prominent spiracle behind the eye, an oval-shaped eye (not rounded), a second dorsal fin much larger than the anal fin, and a caudal fin with a rounded lower lobe. The teeth are very small, with low blunt cusps, they are very numerous and fit together pavement-like, and they are alike in both jaws.

Color: Color is olive gray to brown above, and yellowish or grayish white below.

Size: It grow slightly over 122 cm (48 in.).

Similar species: The small pavement-like teeth distinguish it from the other sharks in the area, except from other smooth-hounds.

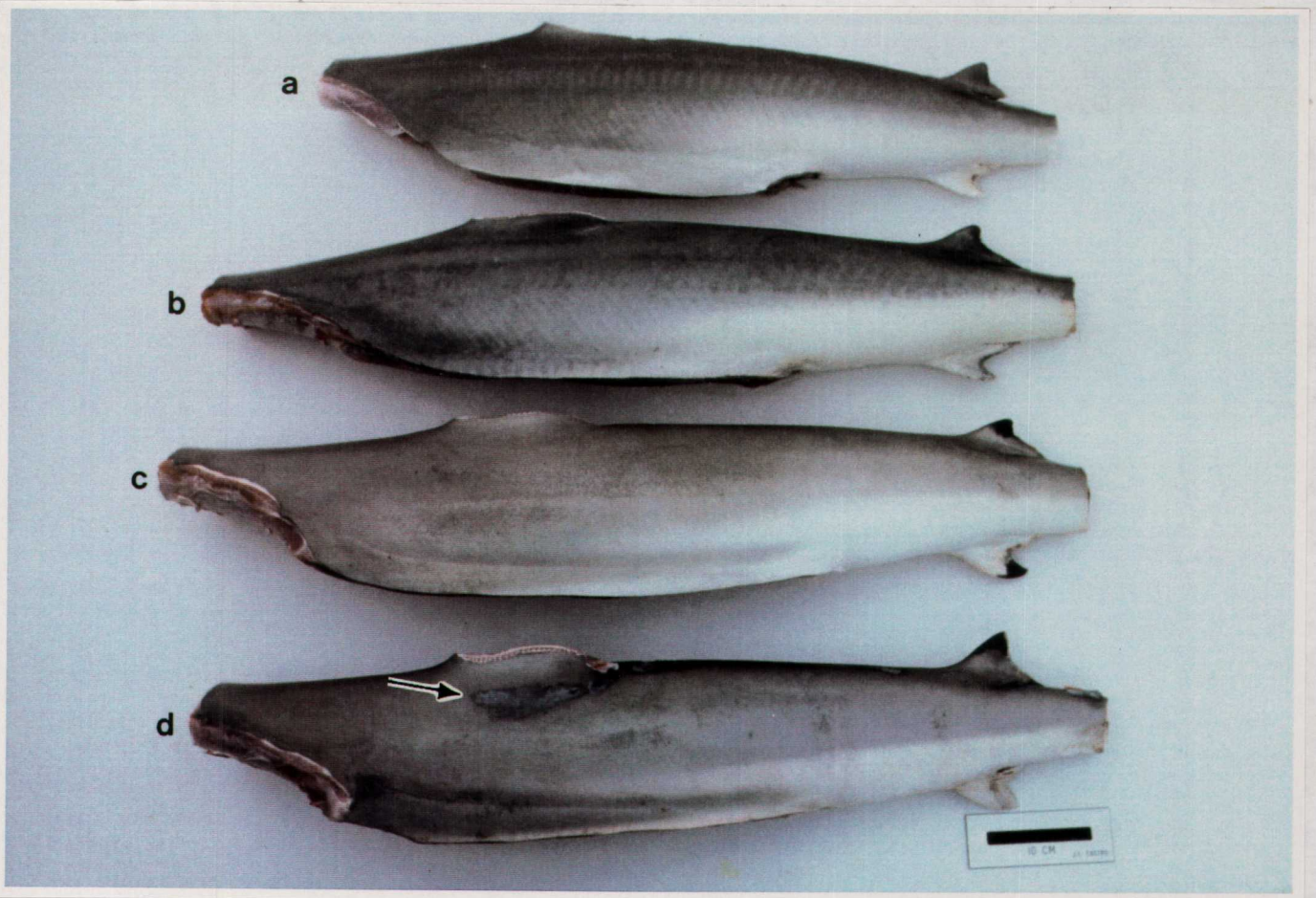
Biology: This is a very abundant shark of bays and coastal waters, usually found at depths under 18 m (60 ft). It feeds primarily on crabs, lobsters and shrimp, but it is an opportunistic feeder and will consume whatever prey is available. It is a migratory species that move north and south with the seasons.

Economic importance: It is one of the most abundant sharks in shallow waters, its abundance exceeded only by that of the spiny dogfish. It sometimes caught in large numbers in shrimp trawls.

Fishing: It is easily caught on hook and lines or on longlines in coastal waters.

Carcass: A small and slender carcass, usually 90 cm (3 ft) or less, evenly brown or light brown in color with no white spots, with two equally large dorsal fins, and a pronounced interdorsal ridge.

APPENDIX
Comparison of Shark Carcasses



Carcasses of the smaller smooth-backed (lacking an interdorsal ridge) sharks. Their color pattern serves to distinguish them from small bull sharks. a) Blacknose shark. The second dorsal fin is dusky and the carcass has a greenish tinge. The upper color fades slowly towards the ventral side. b) Finetooth shark. The carcass is dark bluish gray. c) Spinner shark. Both the second dorsal and the anal fin are black-tipped and there is a band of the darker upper color along the flanks. d) Blacktip shark. The second dorsal is black-tipped (the black diffuses slowly into the gray), and the anal fin is white. Note parasite marks under the first dorsal fin cut (arrow).